

The Commercial Car Journal

VOLUME XI

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NUMBER 6

BIG INCREASE OF TRUCKS ON MASSACHUSETTS HIGHWAY

National Automobile Chamber of Commerce announces that during the last six years there has been a surprising change in traffic using the 1,100 miles of highways embraced in the Massachusetts State system. Motor vehicle traffic has increased at the rate of 70 per cent. a year and horse-drawn traffic has increased 5 per cent. a year.

In 1909, when the State Highway Commission made its first traffic census, taken at 238 points on the road system, 61 per cent. of all vehicles passing these stations were drawn by horses and only 39 per cent. were self-propelled. The counts were made during 14 hours each for seven consecutive days.

In 1912 the percentage was reversed, 63 per cent. being motor vehicles and 37 per cent. horse-drawn. But the annual report of the commission for 1915, just issued, shows that last year 82½ per cent. of all traffic was motor driven.

The number of motor trucks increased in almost the same proportion as touring cars and runabouts in the three years from 1912 to 1915. The increase was 230 per cent. for trucks, compared with 114 for touring cars and 122 for runabouts. There were practically no trucks in 1909.

STUDEBAKER DIVIDEND DECLARED

The Studebaker Corp. directors declared regular quarterly dividends of 1¾ per cent. on the preferred and 2½ per cent. on the common stock, payable September 1, to stockholders of record at the close of business August 21. Heretofore the quarterly dividends on the common stock have been 1½ per cent. plus 1 per cent. extra.

The net profits for the six months ending June 30, after deductions of ample depreciation and profit sharing, were \$6,028,329.16, including \$180,000 from war order profits. After deducting the 7 per cent. dividends for preferred stock, this figure is 18.8 per cent. on the common stock outstanding, and is at the rate of 37.6 per cent. for the year.

The total surplus and reserves of the corporation as of June 30 amount to \$16,664,160.69.

The net profits for the first six months of 1915 were \$5,774,074.87, which, however, included nearly \$3,000,000 of war order profits, leaving \$2,774,074.87 earned from regular business, against \$5,848,329.16 earned from regular business this year, an increase of 111 per cent. The corporation is wholly free from indebtedness, and its cash in banks exceeds \$4,000,000.

The CCJ has most advertisers because it gives them biggest returns

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MOTOR LINE FRANCHISE IN CHINA GIVEN TO AMERICANS

An American company has been given an exclusive franchise for 20 years to operate motor freight and passenger service upon a road to be constructed in return for furnishing a loan of \$100,000 Mexican (\$546,000 United States gold). The highway will extend from Peking to the Western Hills, via the Marco Polo bridge. It is expected that this road will cause the development of suburban residence areas in that region. This is the first step in an extensive plan of public road construction in the Chihli province.

HEADLIGHT LAW TO BE ENFORCED

The Massachusetts headlight law, which states that automobile lamps must throw a 150 ft. beam 3½ ft. high, applies to trucks as well as pleasure cars. Although this law went into effect January 1, truck owners and manufacturers seem to have taken little note of it. Many of the commercial vehicles are so built that the lamps are 4 ft. or more above the ground and are not powerful enough to throw a beam 150 ft. It is impossible on some of these trucks to bend the headlights down so the owners will have to have the lamps lowered and rewired to meet the law. Stringent measures are to be taken to enforce the law all through the State.

ST. LOUIS MOTOR TRUCK COMPANY SOLD

The St. Louis Motor Truck Co., St. Louis, Mo., has been purchased by H. A. Woerman under the name of the Anchor Auto Co. The manufacture of the Paulding trucks will be continued as usual. Extensive improvements have been made in the plant and it is hoped better service can be extended to present owners of these trucks.

REPUBLIC MAKING FINE RECORD

The Republic Motor Truck Co., Alma, Mich., plans to increase its capital to take care of the increasing volume of business. The company is erecting three new buildings to be finished by fall, which will give more than 200,000 sq. ft. of floor space. This is preparatory to entering the light delivery field with a half-ton truck, which they expect to turn out in large quantities.

Garford Motor Truck Co., Lima, Ohio, has increased its capital stock from \$2,500,000 to \$5,000,000, the amount being evenly divided between common and preferred. Proceeds of the new stock will be used to take care of the increasing business. The plant capacity is to be increased by about 40 per cent.

New Incorporations

Vim Motor Truck Sales Co., Columbus, O., has been incorporated with a capital of \$10,000. Wm. K. Williams is interested.

Gardner Taxicab Co., Maplewood, N. J., has incorporated with stock of \$50,000 to manufacture and deal in autos, wagons, etc.

Palda Morse Motors, Inc., Minot, N. D., incorporated with a capital of \$50,000 and will open Briscoe auto and Plowboy tractor agencies.

Republic Motor Truck Co., Boston, Mass., has been incorporated with a capital of \$50,000, Samuel Grow, J. Elmer Cunningham and Samuel Adelman, incorporators.

Russian Alliance Motors Corp., New York City, incorporated with \$100,000 capital, to deal in cars, trucks, machinery, etc. J. Deutsch, L. J. Rosett, A. Goldberg, 200 W. 96th St., incorporators.

Wilson Barber Auto Co., Huron, S. D., incorporated with \$50,000 capital to deal in trucks, supplies and accessories. Wm. Wilson, Wolsey, S. D.; Albert N. Barber, Riverside, Cal., and Percy Brown, Esmond, S. D., incorporators.

American Motor Truck Co., Hartford, Conn., has been incorporated with a capitalization of \$3,000,000. It has the exclusive manufacturing rights of the American fire truck, and will also manufacture a new kind of hospital ambulance.

Ohio Trailer Co., Cleveland, Ohio, has been incorporated with a capital stock of \$35,000 for the purpose of manufacturing and selling several types of trailers. The incorporators are: Wm. M. Byrnes, J. A. Burke, E. C. Spader, Nevada Fitch and Chas. Burke.

Mansen Motor Co., Portland, Me., organized for the purpose of manufacturing, exporting and importing automobiles, motor trucks, etc., with a capital stock of \$1,000,000. The officers of the new concern are: President, Ernest O. Hiler; treasurer, Howard F. Kingsley; clerk, Leon V. Walker.

Ideal Garage & Machinery Co., Muskegon Heights, Mich., has been incorporated by Wm. J. Heir, H. E. Heis and Frank N. Cline, with a capital of \$15,000, and are beginning to erect a 2-story fireproof brick and steel garage on Hackley Place; \$10,000. They will carry the Velie and Maxwell cars and will do all kinds of automobile repair work.

Union Truck Co., Bay City, Mich., has been formed to manufacture the Union truck. The officers of the new concern are: President, J. R. Tanner; vice-president and general manager, H. E. Woodworth; secretary, E. C. Tibbets; treasurer, George Beaulier. Directors, James R. Tanner, H. E. Woodworth, E. C. Tibbets, C. B. Chatfield, H. E. Buck and W. H. Boutell.

Falls Machine Co., Sheboygan, Wis., has been taken over by the Falls Motors Corp. The capital stock of the new organization is \$1,500,000. There will be no change in the personnel or management of the plant. The officers remain as heretofore: G. Huette, president; R. W. Randall, vice-president; A. R. Clas, secretary; K. F. Schreier, treasurer, with the addition of Leroy Miser, as a vice-president, and J. G. Lude, formerly purchasing agent, as assistant secretary. The present output of 50 motors will be increased by October to 80 and by January 1st to 100 per day. A new testing department 250 ft. long has just been completed and an addition to the assembly department, which will be 120 x 180 ft., will be started shortly.

Personal Items

H. A. Conlon has been appointed field sales manager of the Federal Motor Truck Co., of Detroit, Mich.

V. K. McBride has been appointed assistant sales manager of the Federal Motor Truck Co., St. Louis, Mo.

H. M. Rosenberg, formerly St. Louis branch manager of the White Co., has joined the sales department of the Federal Motor Truck Co.

V. K. McBride, for 2 years connected with the sales force of the Federal Motor Truck Co., has become assistant sales manager.

Ben R. Evans and Russell W. Long have joined the McQuay-Norris Mfg. Co.'s sales force as field men, traveling out of the St. Louis Plant.

F. X. Devlin, purchasing agent of the Federal Motor Truck Co., has resigned to accept a similar position with the Elgin Motor Corp., of Chicago.

W. H. Hausmann, who has recently been with the accounting firm of Price, Waterhouse & Co., has returned to the Velie Automobile Co., of St. Louis, Mo.

W. F. Wood, who has been in the motor truck field for a long time, has been appointed general sales manager of the Moreland Motor Truck Co., of Los Angeles, Cal.

W. L. Day, general manager of the General Motor Truck Co., of Pontiac, Mich., has been elected a member of the Board of Directors of the General Motors Corporation, New York City.

H. E. Merrithew, former vice-president and general manager of the O. & M. Supply Co., of Kansas City, has been appointed district manager of the Findesien & Krcp Co., manufacturer of the Rayfield carburetor.

S. H. Humphrey, formerly vice president of the Chalmers Motor Car Co., has been elected vice president and manufacturing manager of the Briscoe Motor Corp., Jackson, Mich. Mr. Humphrey has been identified with the automobile business for a number of years, having started as a mechanic at the Peerless factory in Cleveland and risen to his present position.

Forrest J. Alvin, formerly sales manager of Wheeler & Schebler, and later president of the New Era Engineering Co., of Joliet, Ill., has organized a truck company in Joliet for the manufacture of a light commercial car.

Paul B. Donaldson, formerly connected with the Philadelphia Branch of the Chase Motor Truck Co., has been transferred to the Home Office Organization at Syracuse and will hereafter act as special field representative for General Sales Manager, H. T. Boulden.

E. W. Corman, director of sales and advertising for the Elgin Motor Car Co., of Chicago, has resigned to become identified in a like capacity with the recently organized Deneen Motor Co., of Cleveland, O., which is soon to place upon the market a 1½ ton truck.

George Schumate, a Hurdland, Mo., man, when in need of motive power to cultivate his corn thought of his Ford. He attached the cultivator to the rear of it and soon "the little old Ford was rambling right along," and Mr. Schumate expected to get the corn finished by night.

New Truck Agencies

A. C. Hine Co., 314-16 Pearl St., Hartford, Conn., has taken the agency for the Krebs truck.

Bristol Motor Sales Corp., Bristol, Conn., recently formed, will handle the commercial trucks made by the General Motor Co.

International Motor Co., of New York, is now handling the Mack truck at its local branch, 101 Liberty Street, Springfield, Mass.

Thomas W. O'Connor has taken the local agency at New Britain, Conn., for the Krebs automobile truck. He is also selling the Oakland car.

H. H. Hay, 932 Linden Ave., Baltimore, Md., has become distributor of the D-E motor trucks for Maryland, Delaware and the District of Columbia.

Walter F. Kelley Co., 260-62 State St., New Haven, Conn., has taken over the sale of Vim delivery cars for New Haven and surrounding territory.

Gramm Co., Inc., 1457 Broadway, New York City, will handle the D-E motor trucks in the territory of New York City, Long Island and lower New York state as far north as Albany, and eastern New Jersey, with the exception of Union and Sussex counties.

H. J. Koehler S. G. Co., Newark, N. J., has appointed the following new agencies: H. J. Crumley, Farner, Tenn.; Cadillac Sales Co., Knoxville, Tenn.; W. S. Straus, North Adams, Mass.; Juanita Auto Co., Mifflintown, Pa. It has also appointed the following foreign agencies: Dirk Van Der Mark, Keizersgracht 635, Amsterdam, Holland; F. Galban, Havana, Cuba; W. H. Wheeler Co., Calcutta, India; The Motor Shop, Madras, India.

Torbensen Gear & Axle Co., Cleveland, O., manufacturer of the Torbensen drive internal gear axle for commercial vehicles, has purchased four acres of land on E. 152nd St., upon which will be erected a factory of the Monitor type structure of brick and steel with metal sashes throughout.



LON R. SMITH

New sales manager of the Auto Motor Department of the Buda Company, Harvey, Ill. Before going with the Buda Company, he represented the Eisemann Magneto Company in the central and western states for the past six years.

Question and Answer Department

NO TRADING-IN POLICY AND HOW IT HAS WORKED OUT WITH HIGH-PRICED TRUCKS IN NEW YORK CITY

July 28, 1916.

To the Editor:

The articles in your July 15th issue about motor trucks that have proven unsatisfactory are of great interest to me. In one sentence of your editorial you describe the situation very nicely when you say, "Most truck dealers have the problem to face and must meet it in their own characteristic manner." There does not seem to be enough character in the motor truck business. We should cultivate it in ourselves instead of indorsing the large and unsuccessful class of mediocrity.

Our experience should be of interest, as we have succeeded in marketing a truck of radical design, which five years ago all other American truck manufacturers claimed would be a failure.

Advocates Special Dealers for All Used.. Trucks.

The only discount we have ever given has been based on our advertised sliding scale for quantity orders only, and we have never made any other concession in price or guarantee, neither have we ever considered a used truck of any make as part payment for another truck. We are opposed to old, worn-out trucks being kept on the road. If the first buyer cannot make them pay no one else should be allowed to try, unless the truck has been first gone over by a reputable, experienced dealer in old trucks. These dealers should negotiate direct with the operator of the truck, buy it outright, make necessary repairs and give a reasonable service after the truck is delivered.

But the idea that putty and paint only are required, with perhaps in extreme cases the use of something to quiet excessive noise, such as heavy oil with graphite or pulverized mica added, is all wrong.

Some purchasers may say, "It is only an experiment," but they will come back quickly enough if it fails and then the industry gets another mark against it. A new truck would more likely make the experiment successful and the sale a profitable one. One of your contributors says, "sell them to the junk man," but they should go there as junk, not as a serviceable vehicle. Others recommend the farmer, the rancher, or the miner. The gullibility of these more simple folk should not be imposed upon. It is true the smart city chap may find them a good market, but we should only want to do things that will give us eventual profit, reputation and a comfortable future. It is not possible to get rich quickly in the motor truck business, with either new or old trucks.

Old trucks for the benefit of all interested should be kept in or near the cities to facilitate and cheapen the repairs constantly required.

Considering the possibilities of the motor truck, it is remarkable that so very few persons have definite ideas about how they should be marketed. Salesmen are the go-betweens and most of the truck policies are based on their arguments or data they collect or talk about, so first of all we must have capable salesmen and little more is expected from an encyclopedia than is demanded from a successful truck salesman.

Salesmen Not Keeping Pace With Engineers.

There must be a dominant company in the industry with product, policies and methods conspicuously satisfying, and until such an organization is developed the business of motor trucks will not be really started. The engineers are doing more than their share, as the trucks themselves are improving steadily, but the sellers are not keeping pace. The selling conditions are about the same as those of over fifteen years ago; just think of all the failures in our business since then, —and all to my mind for the same reasons, —lack of firmness, fairness and faith in their selling methods.

If trucks are not made and sold properly, and if the buyers insist upon telling us how to run our business they should abide by the consequences of their own poor judgment. We have the cheapest form of land transportation known; we will soon replace millions of horses and put some railroads on the defensive.

The most common method used for lowering the price is to force an old truck on the seller, and why this practice is tolerated by the reputable dealers is beyond my comprehension, as there are hundreds of instances where it has brought ruin to those who have.

Eliminate Truck Trading.

The worn-out or inefficient motor truck should no longer be rated as cash by the prospective buyer of new trucks, and if the manufacturers will co-operate they can eliminate absolutely all truck trading, except with machines of their own make; of course, if we sell trucks that are not suitable for the work they have to do, we should abide by the consequences, and if developments prove that a different size will answer better we should help the customer out, but there is no sane reason why we should allow the buyer to think that our position is so weak that we must dispose of his old trucks for him. As a rule, concerns who insist upon our doing so generally turn out unsatisfactory customers. Grasping people who want everything their own way should not be cultivated; there are plenty of fair-minded prospects to keep us all busy for years to come, the sheep will steadily fall in line, and last of all we can then consider the "Know-it-alls," but unfortunately we have sought the last class first.

In January, 1913, there were over 8800 motor trucks in New York City and vicinity, and the owners of at least 3000 of these old trucks are anxious to dispose of them and secure latest models, and for obvious reasons.

Many of these different makes of trucks are no longer manufactured. None of the foreign trucks are now obtainable here, and very few of them have representatives, and further, practically all the long-existing companies have changed their models radically.

But these orphans and obsolete models are in daily evidence, the layman knows them by their noisiness alone; the police know them by the traits peculiar to all derelicts. We all know them when traveling is strenuous by their habit of failing completely, generally in a congested locality, and silent at last they remain for a considerable time an obnoxious monument to ignorance, neglect and abuse.

Many of these trucks were sold at cost and even less with the hope that they would lead to profitable transactions. The big buyers have been the greater transgressors, they have been most dictatorial in their dealings and without cause, as large investments with them are not nearly so serious as the purchase of one truck is to the little fellow. Then again, the large companies have men trained to select for them and so can eliminate every undesirable truck, securing only those that will be a lasting gain.

Every man has some pride; few will admit a mistake; the whole town soon knows he has bought a truck, and he becomes an object of envy or ridicule immediately, and you can rest assured there is something radically wrong when he wants to exchange his truck for another.

Every old truck sold prejudices some one against you and your company. It is easier to sell a new truck than an old one, and the new truck brings the greater profit and entails the least responsibility. You cannot sell an old truck by truthful statements only.

The man who considers price first, last and only, should be avoided. There is enough good business in sight to make us all rich, and the dictatorial buyers are learning more each day, so let us go after the straight sales only.

It is all a matter of salesmanship, and we should be loath to admit that some men can sell us worn-out old trucks. Let the owners of big fleets use up their oldest trucks to keep the newer ones a-going, or dispose of them as already mentioned. A few dollars more or less will not stop a sale if your truck is desired above all others, and we should make it so.

HARROLD'S MOTOR CAR CO.,
ROBERT C. REID,
Manager Truck Department.
New York.

KEROSENE VS. CARBON

To the Editor:

I notice in your issue of May 15th last, an article on "Kerosene, the Motor Truck Fuel of the Future."

I am most anxious to know whether or not the usual experience with kerosene-burning cars, with relation to carbon, indicates that they accumulate more than gasoline motor cars; in other words do kerosene-burning cars give more or less trouble on account of carbon, than gasoline cars?—W. O. Wirland, Louisville, Ky.

ANSWER:

Carbon accumulates in all engines. The extent to which it accumulates is usually an indication of the efficiency of the carbureting device, where the carbon is not due directly to an excessive use of oil or to accumulations of dust going in through the intake pipe. Much of the so-called carbon deposit is from this latter source. As carbureting the non-volatile kerosene and making a perfectly homogeneous and dry mixture is more difficult than accomplishing the same thing with volatile gasoline, there is more chance of imperfect carburetion and consequently imperfect combustion, with a greater amount of resulting carbon.

As many of the devices are experimental, carbon deposits are more likely than with more volatile fuels. However, carbon deposits are not necessary and there are several makers who claim even less carbon deposit when using kerosene.

We would advise you to communicate with the various kerosene burning device

makers; those supplying carburetors are as follows:

Breeze Carburetor Co., 250 South Street, Newark, N. J.; Camden Anchor-Rockland Mch. Co., Camden, Me.; Eureka Carburetor Co., Rudd, Ia.; H. & N. Carburetor Co., Inc., 1790 Broadway, New York City; Invincible Mfg. Co., 431 Amberson Avenue, Pittsburgh, Pa.; Kerosene Burning Carburetor Co., 707 Woodward Avenue, Detroit, Mich.; Reid Appliance Co., Smith Bldg., Detroit, Mich.; Richard Carburetor Co., 1032 Engineers' Bldg., Cleveland, Ohio; Senrab Carburetor Co., Sea Cliff, N. Y.; Universal Oil Converter Co., 67 Sixth Street, Long Island City, N. Y.; Western Motor Appliance Co., 201 Main Street, Charles City, Ia.; Wilcox-Bennett Carburetor Co., 1030 Marshall Street, N. E., Minneapolis, Minn.

It must be remembered that the successful use of kerosene in nearly all engines demands more than merely attaching another carburetor. Extra heat must be supplied and in the proper manner, the mixture after it is made must be kept heated uniformly throughout and never overheated and the engine must not have spots in it where masses of metal accumulate heat and have a tendency to crack the fuel. If you desire to run on kerosene you can now undoubtedly get satisfactory devices for this purpose.—Editor.

MEETING OF AUTOMOBILE REPRESENTATIVES AT WAR COLLEGE

Truck and Military Transport Plans

Another meeting was held the first week of August at the War College in Washington to discuss plans for mobilization of troops and supplies in time of war, particularly so far as civilian organizations are concerned. Major Palmer E. Pierce of the General Staff Corps presided at the meeting, Lieut. Col. Chauncey B. Baker being present to represent the Quartermaster General's office. Representatives of the Naval Consulting Board, the National Automobile Chamber of Commerce, the Society of Automobile Engineers and the American Automobile Association committees were in attendance.

New Truck Specifications Being Developed

Information is being collected as to just how many government departments need a large motor truck equipment, in order that suitable specifications can be developed for each type of truck required. The Truck Standards Division as well as other Divisions of the Standards Committee of the Society of Automobile Engineers will, as in the past, take a leading part in this work. Serious attempt will be made to develop specifications of proper length, that is, neither too long nor too short, covering adequately the requirements of the government, which it is felt will eventually harmonize to a greater extent than has been expected heretofore with the needs of private users of commercial motor vehicles. Some well qualified experts feel that within two or three years the commercial product will approximate what according to the best opinion will be suitable for operation in all except special cases of government service. This is undoubtedly the best line of procedure, as it is not likely that a sub-

sidiy plan will be established in this country in connection with truck manufacture. Both the truck manufacturers and the government want to improve the current truck specifications.

Border Tests Most Severe

It is agreed that the tests to which trucks have been subjected on or near the Mexican border are the most severe that have been had in any part of the world. The conditions of service have been abnormal in that the lines of communication have been maintained without the use of railroads. The performance of some of the trucks has been wonderfully good but there is room for further beneficial specification in various respects. The necessary engineering study is now being made, many of the S. A. E. members going to the Mexican border to view at first hand the unusual conditions of weather, sandy grit and alkali encountered.

The development of suitable tractor types of motor vehicle will also be given attention.

Auto Better Than Trains

Past-president Wilson, of the American Automobile Association, announced that over ninety per cent. of the millions of American pleasure car owners would very willingly and quickly tender the use of their vehicles under any suitable plan of mobilization. This will make possible immediate transportation preparedness which would be wanted in case of emergency. It is stated reliably that in many districts large bodies of troops can be mobilized by motor cars ready to transport them. Demonstrations which have been made repeatedly show that troops can be moved by automobile faster than by train.

Suitable types of armored cars for use by the Ordnance Department as well as types meeting the needs of the Engineers, the Signal and the Artillery Corps will be developed.

Roads and Bridges Being Considered

Emphasis was again placed upon the vital importance of good roads. It was pointed out that \$225,000,000 was spent on good roads in this country last year and that in some of our territory we now have the best road systems in the world. The location and construction of roads and bridges are being given due consideration from the military standpoint. This is in conformity with the plan that all the technical activities of the country will be availed of.

Those in attendance at the meeting were: Major Palmer E. Pierce, General Staff Corps; Lieut. Col. Chauncey B. Baker, Quartermaster Corps; Major L. P. Williamson, Medical Corps; Howard E. Coffin, Chairman Industrial Preparedness Committee, Naval Consulting Board; Bion J. Arnold, Chairman Transportation Committee, Naval Consulting Board; Alfred Reeves, Chairman Military Transport Committee, N. A. C. C.; George W. Dunham, member Military Transport Committee, S. A. E.; A. L. Riker, member Transportation Committee, Naval Consulting Board; H. D. Church, Chairman Truck Standards Division, Standards Committee, S. A. E.; Wm. P. Kennedy, member Military Trans-

port Committee, S. A. E.; John A. Wilson, Chairman Military Preparedness Committee, A. A. A.; Amos G. Batchelder, member Military Preparedness Committee, A. A. A.; J. S. Marvin, manager Traffic Department, N. A. C. C.; W. H. Allen, member Tire & Rim Division, S. A. E. Standards Committee; Coker F. Clarkson, Chairman Military Transport Committee, S. A. E.

TRUCKS FINISH WITH PERFECT SCORES IN RELIABILITY CONTEST

The Pacific California International Exposition Commercial vehicle run was one of the most severe and comprehensive tests that automobile trucks have ever been subjected to. The route was from Los Angeles to San Diego, with some necessary detours.

The event was widely heralded and the extreme interest thus aroused caused an entry list that included practically every make of commercial vehicle. Among the cars entered were three Philadelphia made Vim half-ton delivery cars by N. L. Arnold, the Los Angeles distributor of the Vim Motor Truck Co. Two of them carried loads of 1100 lbs. and one a load of 1200 lbs. All three Vims, and they were the only team that did so, finished with a perfect score.

The three Vims showed a gasoline consumption of $9\frac{3}{4}$, 10 and $10\frac{1}{2}$ gallons, respectively, which is remarkably low in view of the grades and roads which had purposely been included in the trip.

After checking in at the Exposition, drivers, observers and officials adjourned to the lunch table. After the inner man had been satisfied the official tests were held. These took place at the motor demonstration grounds at the Exposition.

First came the brake test. A fifty foot space was marked off and the machines, going at their average running speed, were required to stop in this space. All the Vims succeeded without trouble. The cars undoubtedly burnt their tires much to the amused pleasure of the accessory and tire dealers standing around, but that was all. The stop was made quickly, suddenly, satisfactorily. Gear tests came next, which the Vims completed with perfect scores. The final test was that of the clutch. The machines were driven up against an 8 in. curb, low gear was engaged and the foot clutch released. The Vims climbed the curb without the least difficulty.

G. M. C. IN AN ENDURANCE CONTEST

Eleven of the fourteen entrants finished with perfect scores. G. M. C. model 15, carrying 1670 lbs., was penalized a few points on account of an accident. The

One of the biggest attractions was the three-and-a-half ton G. M. C., loaded with 7400 lbs. of cement. Despite her entry number, thirteen, she finished with a perfect score. The driver was H. E. Heard. Both trucks went through the A. A. A. brake and clutch tests successfully after the run. The entries were made by Don Lee, G. M. C. distributor for California.

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TRAILER OPPORTUNITIES APPARENTLY OVERLOOKED BY DEALERS

THE value of trailers in certain lines of work has been growing in the mind of the owner. Has it been growing in the mind of the dealer as rapidly? Apparently not, for very few automobile truck dealers are taking on the agency for trailers.

One of the drawbacks which has prevented a more extended use of trailers is the condition of the roads. This condition, of course, improves from year to year and with it, the use of trailers increases. It is perfectly possible, with the ordinary truck, not only to add one-third to its carrying capacity, but in certain kinds of work to double the capacity of the vehicle, without doubling the expense of operation.

If the dealer holds back with the thought that the trailer may prevent the sale of another truck, he is using a very short sighted policy and one which will merely result in somebody else getting the business.

We recognize that there are a few manufacturers of trucks who have taken a decided stand against the trailer, but

they merely take the position that the trailer should not be used with a truck which is not made for the purpose. On the other side of the question, we find that a larger number of manufacturers say that their trucks are perfectly capable of handling trailers, they plan for it and do not object to trailers being used. This is particularly true of small sized trailers. When it comes to handling four, five and six tons on a trailer, then there may be a question as to the advisability of doing this, unless special gearing, methods of attachment or steering and braking are provided for.

Any device or mechanism which makes for economy of transportation is bound to succeed in the end. This fact must be recognized by the truck dealer. If he does not recognize it and establish himself as a dealer in trailers, as well as trucks, this business is going to be handled by others, although the truck dealer is the most natural source for distribution of anything which pertains to motor driven vehicles.

Trailers are no longer an experiment. They have been tried and have proven themselves under proper conditions to be a most economical and efficient piece of mechanism. If we care to look for an example of the use of trailers, where the roads are better than in this country, all we have to do is to look to Europe—there the trailer has been developed to a great degree of efficiency and has been in common use for many years. The same thing will eventually be true in this country, beginning with the lighter weight trailers and gradually increasing, until we, undoubtedly, will use truck and trailer trains for hauling and as feeders to and from railroads in the great West.

Right now, however, there is a growing demand for trailers in and around the farming communities surrounding the cities, and also in the cities themselves for handling plumber supplies, building material, lime, coal, etc.

It behooves the truck dealers to look into this matter and investigate more thoroughly the situation.

MIXTURE REGULATION FROM THE DASH



IT is well-known to all drivers that a much richer mixture is required in starting than when the engine is thoroughly heated up. This is due to the low grade fuel and in some instances to the actual percentage of kerosene in the fuel. Economical running demands that the carburetor setting be changed after the engine becomes warm. If it is left as required for proper performance when the engine is cool, much fuel is wasted, and fuel today means money, especially on a commercial car. Every car should have within convenient reach of the driver a means for cutting down or weakening the mixture as soon as the temperature of the engine will permit. Many trucks already have such device and the others should follow suit. We have now reached the age of efficiency of operation, and no detail is too slight to be overlooked.

MOTOR TRUCK SHOW AGAIN ADVOCATED FOR DETROIT

Doubtless owing to the fact that the Michigan State Fair management intends to build a large coliseum at the Detroit Fair grounds, there is again an agitation for a Detroit truck show. It is believed by motorists who are interested that this

building will be suitable for a motor truck show, in which vehicles in active demonstration could be seen in the ground, while the ordinary truck show, as held in the past, could be held within the building itself.

We advocate the holding of an outdoor show, if any

show at all is held. We do not believe in the standing inert dead kind of show that was held a few years ago, and up to the time of the discontinuation of motor truck shows, but we do favor, if shows are going to be held again, an outdoor demonstration, preferably in the fall.

Steel and Rubber Markets

Steel Market Continues Strong

Buying of shells by the Allies continues to be the strong feature of the steel market. During the latter part of July a total of \$60,000,000 worth of war business was placed. The demand for steel rails by practically the entire world has engaged the capacity of the American rail mills up to the end of 1917.

Quotations on August 8th were:

Steel Products Prices

Bessemer billets, per ton, mill...43 00 a
Open hearth, per ton, mill....42 00 a
Sheet bars, per ton.....42 00 a
Forging billets, per ton, mill...65 00 a 70 00

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill; smaller lots are \$2 per ton higher.

Blue Annealed Sheets— Cents per lb.
Nos. 11 and 12..... 3.05 a 3.30
Nos. 13 and 14..... 3.10 a 3.35
Nos. 15 and 16..... 3.20 a 3.45

Box Annealed Sheets, Cold Rolled—
Nos. 22 and 24..... 2.75 a 2.85
Nos. 25 and 26..... 2.80 a 2.90
No. 27..... 2.85 a 2.95
No. 28..... 2.90 a 3.00

Galvanized Sheets of Black Sheet Gauge—
Nos. 10 and 11..... 3.25 a 3.35
No. 12..... 3.35 a 3.45
Nos. 13 and 14..... 3.35 a 3.45
Nos. 15 and 16..... 3.45 a 3.55
Nos. 17 to 21..... 3.60 a 3.70
Nos. 22 and 24..... 3.70 a 3.80
Nos. 25 and 26..... 3.85 a 3.95

Above prices are for Bessemer stock. For open-hearth stock \$2 per ton advance is charged.

Iron and Steel at Pittsburgh

Bessemer iron, Valley furnace..21 00 a 21 50
Bessemer steel, f.o.b. Pittsburgh.40 00 a ..
Skelp, grooved steel..... 2 35 a 2 45
Sheared steel skelp..... 2 45 a 2 50
Skelp, grooved iron 2 70 a 2 80
Sheared iron skelp..... 3 00 a 3 10
Ferromanganese (80 per cent.),
seaboard 175 00 a ..
Steel, melting scrap 16 50 a ..
Steel bars (contracts)..... 2 60 a ..
Black sheets, 28-gauge 2 90 a 3 00
Galvanized sheets, 28-gauge.... 4 25 a 4 50
Blue annealed, 10-gauge..... 3 00 a 3 25
Tank plates, 3/4 and heavier.... 3 50 a ..

Rubber Market Inactive

Since our last report no important developments in the rubber market have taken place. The price has fluctuated very little. The tire makers and other consumers are inclined to hold off, being fairly well supplied for their requirements. Quotations on August 8th were:

Para—Up-river, fine, per lb..... 65 a 66
Up-river, coarse 39 a 40
Island, fine 58 a 59
Island, coarse 27 1/2 a 28
Caucho, ball, upper 3 a 41
Caucho, ball, lower 38 a 39 1/2
Cameta 32 a ..

Ceylon—First latex, pale crepe..	57 a ..
Brown, crepe	53 a 53 1/2
Smoked sheets	56 1/2 a ..
Centrals—Corinto	39 1/2 a ..
Esmeralda	38 a 39
Guayule	33 a 34
Balata, sheets	71 a ..
Balata, block	56 a 58
Mexican—Scrap	37 a ..
Frontera	38 a ..
African, Massai, red	a ..
Domestic Scrap Rubber	
Tires—Automobile	5 1/2 a 5 1/2
Bicycles, pneumatic	3 1/2 a 3 3/4
Inner tubes, No. 1	24 a ..
Inner tubes, No. 2	10 1/2 a 11
Red	11 a ..

M. T. C. A. TO HOLD OUTING

The Motor Truck Club of America announces the date of their annual outing as September 13th, to be held at Karatsky's Hotel, Glenwood Landing, Long Island, N. Y. The personnel of the Outing Committee is as follows: Roderick Stephens, ex-officio, Olin J. Stephens, Inc.; Willard S. Mears, Chairman, Sterling Motor Truck Co.; T. A. Aspell, B. F. Goodrich Co.; A. C. Bergmann, The Perfection Spring Co.; Charles G. Bond, Coulter & Bond; F. Nelson Carle, General Vehicle Co.; Haywood P. Cavalry, National Lead Co.; C. M. Geiger, Peter Doelger Brewing Co.; Robert Hunt, Jr., Peter Doelger Brewing Co.; Joseph Husson, "Commercial Vehicle"; Henry K. Jaburg, Jaburg Bros.; George H. Logan, Empire Carrying Corp.; Joseph K. Orr, Thos. Orr Trucking Co.; W. Oscar Shadbolt, Shadbolt Mfg. Co.; C. Monroe Smith, "Commercial Car Journal"; A. G. Taylor, E. W. Bliss Co.

FORD TO BUILD ONE-TON WORM-DRIVE TRUCK

According to official announcement by the Ford Motor Co., it will place on the market about January 1, 1917, a one-ton worm-drive truck. The price has not yet been decided. It is said that about 200,000 trucks will be built the first year.

R. MARTENS & COMPANY, INC., TO EXTEND THEIR EXPORT OPERATIONS

As a result of the business activity of R. Martens & Co., Inc., in behalf of American manufacturers of mechanical goods, who have entrusted their interests in Russia to them, inquiries for all classes of merchandise are being received.

The original purpose of limiting the operations of Messrs. R. Martens & Co., Inc., to the mechanical lines of industry will be strictly adhered to. But to conserve the tremendous opportunity for non-mechanical lines, they have created a subsidiary company under the name of "Russia Trade Corporation of America." The new concern will have a complete business organization and its general offices will be in the Maritime Building, 8 & 10 Bridge Street, New York, and all business transactions will be entirely separate and distinct from the parent company.

THE HURLBURT MOTOR TRUCK Co., Third Ave. and Harlem River, New York City, has issued a catalog which is thoroughly in keeping with the company's high-class product. The catalog is profusely illustrated and contains approximately 100 pp.



Jeffery Quad Somewhere in Mexico

Here are shown the advance trucks of a Jeffery Quad train emerging from a rocky, tortuous canyon south of El Valle. To get an idea of the road's condition, note the respective positions of the lead truck and its trailer. These trucks go virtually anywhere a four-mule army team can go.

Review of Attachments or Units for Converting Pleasure Chassis Into Trucks



THE growth of the business of converting Ford and other small pleasure cars into trucks or light delivery vehicles of 1000 to 1500 lbs. has almost become an industry of itself. In fact, the number of vehicles thus converted per year ranks almost with the number of trucks manufactured. This of course includes Fords on which merely commercial bodies are placed.

In this article, however, we wish to call attention particularly to the devices on the market which are in the form of units for converting these small pleasure cars into trucks, usually by means of supplying a truck axle of some kind to carry the load, thus relieving the pleasure car rear axle of this duty. In some cases the pleasure car axle is retained in the form of a jack-shaft; in others it is combined with a solid axle, being used as the live axle for transmitting torque only where an internal gear is used; in other cases the rear axle is done away with altogether, and a heavy truck axle, of one form or another, is placed under the vehicle together with suitable springs.

As with other things which have been of gradual growth, it is very difficult to accurately determine who originated the idea. Pleasure cars were converted into trucks many years ago, even when the pleasure car business was still in its infancy, but it was not until within the last two years that units for the purpose have been placed on the market commercially. F. G. Burghoffer, of the Bellingham Machine Works, Bellingham, Wash., claims to have delivered a device for this purpose to the Canfield, Caulkins Implement Co., of Bellingham, some time in 1912. H. N. Rothweiler, of Rothweiler & Co., Seattle, Wash., also claims to have built some such attachment in 1913.

A. D. Smith, of the Smith Form-a-Truck Co., who also operated in Seattle, claims to have completed in 1913 a chain drive attachment very similar to what is now being manufactured. In 1914, the manufacture of these devices was gone into in a larger way by the Smith Form-a-Truck Co., with headquarters in Chicago, and the chain driven unit was commercialized.

Following the chain units there were placed on the market some chainless units, of the internal gear drive type, the credit for commercializing which is given to the Hudford Co., Philadelphia.

There are now in the neighborhood of 23 companies manufacturing converter units of one type or another. Business with nearly all of these converter companies came rapidly and shows that the public is anxious for just such devices. It is said that \$12,000,000 worth of one of these attachments was contracted for within four months of one company's organization. In another instance the business rapidly outgrew its quarters and its developer

realized, within two years of the conception of the business, over \$250,000 by sale of a part interest. Sales are steadily increasing and the conversion of pleasure car chassis into commercial chassis, by means of these units, has proven successful in practice.

The following is a brief review of all the units now on the market on which we could get data and should therefore prove

of interest to those who are looking for such devices.

Owing to the fact that some of these attachments for converting pleasure cars into trucks have specifications varying so greatly from those given in the table, it is necessary that these attachments have their specifications given separately. The specifications of these attachments appear directly after the table.

Name	Drive	Capacity	Wheelbase	Percent of Load on Rear Wheels	Weight	Gear Ratio	Tires	Price	Loading Space
Ames Motor Car Co., Owensboro, Ky.									
Unit	W	2000	120	..	2000	6.2:1	32x3½S	395	8.5
Automobile Mfg. & Engineering Co., Detroit									
Chassis Convertor	C	2000	135	..	..	..	32x4S	350	...
Dearborn Motor Truck Co., Chicago.									
Dearborn One-Ton	C	2000	125	..	1840	7.5:1	32x3½S	350	8.83
Detroit Truck Co., Detroit									
Tonford	C	2000	125	90	..	..	S	325	...
Hudson Co., Philadelphia									
Hudson—Model A	IG	2000	112	90	2100	7.1:1	34x4½	360	...
Hudson—Model B	IG	3000	114	..	..	..	34x4S	460	...
Iowa Motor Truck Co., Ottumwa, Ia.									
Iowa Commercial—									
Chassis Model E	IG	2000	116	..	925-U	8:1	32x3½S	375	...
						7:1			
Model O	IG	3000	116	..	1250-U	8:1	32x3½S	450	...
Jewett Car Co., Newark, O.									
Jewett Attachment									
Model A	IG	2000	118	..	..	6:1	34x3½S	375	...
		3500				7.4:1	34x4½		
Maxfer Truck & Tractor Co., Chicago									
Maxfer Ton Truck									
Maker	C	2000	125	..	2100	7.1:1	32x3½S	350	9
									11
Rayford Co., Philadelphia									
Rayford Chain Drive									
Unit	C	2000	124	90	2000	7:1	32x3½S	300	10
Rayford Internal Gear									
Unit	IG	2000	124	80	1000-U	7:1	32x3½S	300	10
Redden Motor Truck Co., New York City									
Redden Make—									
A-Truck	C	2000	132	..	900-U	7.25:1	34x3S	350	10
Robinson Machine Co., Detroit									
Truckford	C	2000	128	..	875-U	7:1	32x3½S	350	8.5
									11.5
Simplex Truck Co., Chicago									
Simplex Truck Unit	C	2000	127	..	1000-U	..	32x3½S	325	...
Smith Form-A-Truck Co., Chicago									
Smith Form-A-Truck	C	2000	125	90	..	..	32x3½S	350	...
Union Truck Mfg. Co., New York City									
Union Tractor Unit	C	6000	110	90	2200	9:1	3½S	375	...
Union Truck Chassis									
Attachment	C	2000	125	75	2100	7:1	32x3½S	350	9
									11
Woodward Truck Attachment Co., Los Angeles, Cal.									
Ton-Ford Truck Attachment	C	2500	124	..	..	6:1	32x3½S	350	8
						7:1			
Wright Truck Attachment Co., Seattle, Wash.									
Wright Truck Attachment	C	2000	122	90+	1910	8.29:1	S	350	...

Key to Abbreviations

Drive—W., worm; C, chain; IG, internal gear. Capacity and weight given in pounds. Wheelbase and tire sizes are given in inches, solid tires being designated by S. The letter "U" after the weight signifies the weight given is that of the unit only.

**Hayes-Diefenderfer Company, Inc.,
New York City**

This extension lengthens the Ford chassis either 15 in. or 30 in. and includes frame, shaft and all brake rod extensions. The 30 in. extension provides 88 in. of loading space back of the driver's seat, and the 15 in. provides 72 in. The prices are \$55 and \$60.

**Maremont Manufacturing Company,
Chicago**

The Camelford attachment strengthens the Ford rear and allows the carrying of heavy loads. The weight is 110 lbs. Springs are 44 x 2 in. and have seven leaves. Price \$40.

Walter J. Forbes, Boston

The Forbes System lengthens the Ford chassis, and reinforces it as well. The price is \$100.

**Motor Accessory Distributing Company,
Boston**

The Longford Auto Parts lengthen the Ford chassis 3 ft., making it have a 136 in. wheelbase. Loading space is 8 ft. Price \$125.

Swedish Crucible Steel Company, Detroit

The Olson Unit consists of springs, radius rods and steel wheels, price \$65. The capacity is one ton. Full floating type axle, roller bearings. Weight 295 to 355 lbs. complete.

Laconia Truck Company, Laconia, N. H.

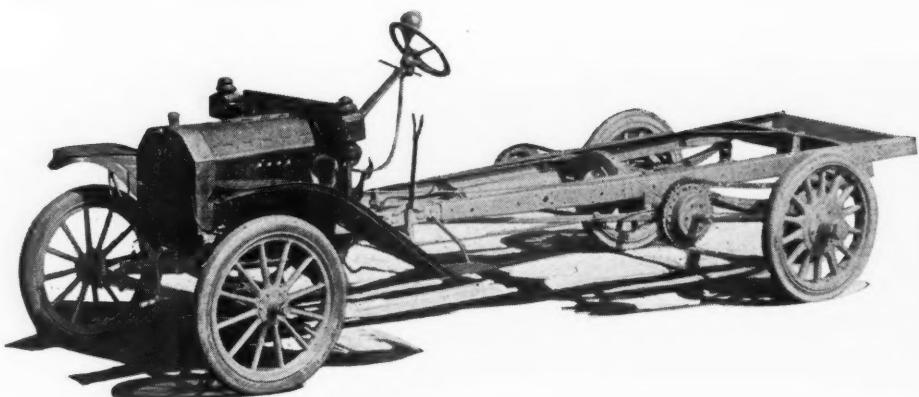
The P. B. B. Assembly lengthens the Ford wheelbase to 124, 130 or 136 in., price \$100. Capacity 1200 to 1500 lbs.

Xtend-A-Ford Company, Philadelphia

The Xtend-A-Ford outfit lengthens the Ford chassis to make a 115 or 130 in. wheelbase. Weight 50 lbs., capacity 1000 lbs., loading space 90 to 100 in. on the 130 in. model, width 41 in. Prices are \$67.50 and \$75 for the 15 and 30 in. extensions respectively.

SMITH FORM-A-TRUCK

The Smith Form-a-Truck Co., of 1470 Michigan Ave., Chicago, offers the Smith Form-a-Truck, a chain drive unit of one ton capacity. It has chain drive, solid tires, drop-forged axle, and wheelbase of 125 in. The loading space is 108 in. The frame is reinforced by two cross members and gusset plates at the rear. The speed of the truck is 15 m.p.h. The drop-forged axle is 1 3/4 x 2 1/4 in. The wheels have 2 in. spokes, and are equipped with Firestone solid truck type tires, 32 x 3 1/2 in. The springs are semi-elliptic, 42 x 2 in. This unit also has an auxiliary cross relief spring. Furnished as regular equipment with each unit is a Strong Sight Feed Oilier for the Ford engine. This is a force feed system with a gage on the dash. The price of the unit is \$350.



Chassis Convertor

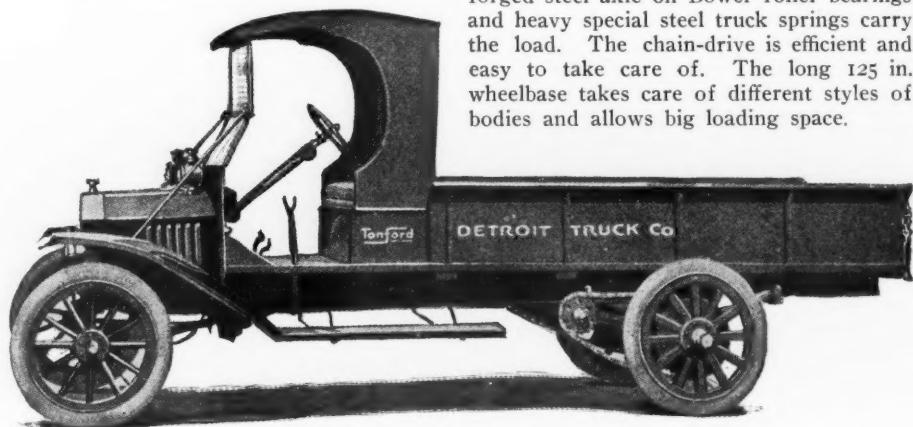
CHASSIS CONVERTOR

This chassis convertor is made by the American Mfg. & Engineering Co., 149 Fort Street, West, Detroit, and is listed at \$350 installed, or \$750 with the necessary Ford chassis parts. In this convertor outfit the Ford rear axle is used as a jackshaft, drive from it to the rear wheels being by chain. The frame is 4 x 2 1/2 x 3-16 in. pressed steel bolted to the chassis of power plant, which forms a sub-frame for truck attachment. Springs are platform three-point suspension, made so that the rear cross

TONFORD

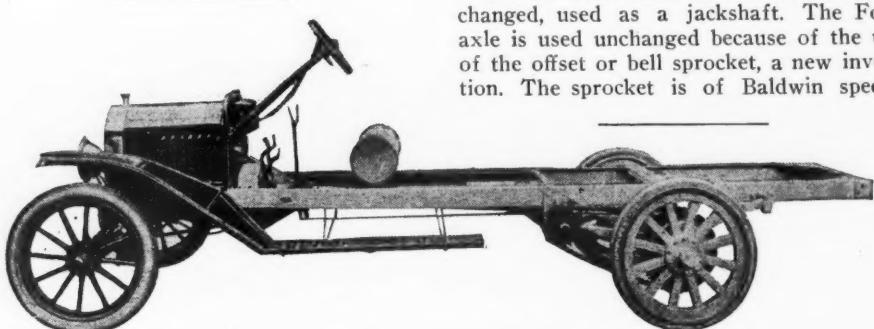
The Detroit Truck Co., of Detroit, Mich., offers the Tonford truck unit for converting the Ford chassis into a ton truck. The price is \$325.

The Tonford unit carries 90 per cent. of the load and is composed of a pressed steel channel section frame that fits over the Ford frame. The rear axle of the Ford becomes the jackshaft of the Tonford truck by taking off the rear wheels and putting on two sprockets that are furnished. Heavy artillery truck wheels with solid tires, drop forged steel axle on Bower roller bearings and heavy special steel truck springs carry the load. The chain-drive is efficient and easy to take care of. The long 125 in. wheelbase takes care of different styles of bodies and allows big loading space.



Tonford Unit

spring acts as an auxiliary when carrying light loads up to 500 lbs., heavier loads being carried by the truck unit springs. The axle has Timken bearings, and chains are Convert and Taylor. Rear wheels are 32 x 4 in. and have solid Firestone tires. Service brakes are on rear axle and the emergency are on the jackshaft. This unit has a capacity of 2000 lbs., but can carry a 50 per cent. overload. The wheelbase is 135 in.

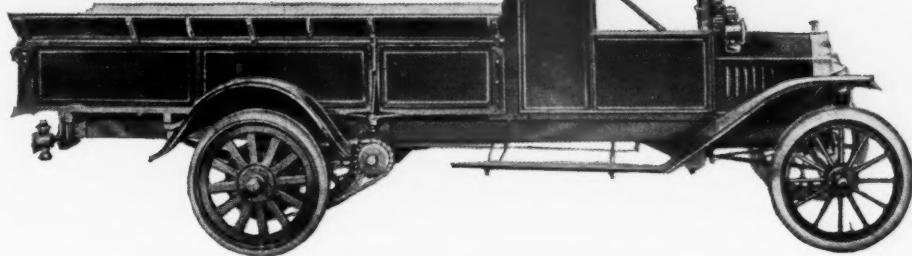


Smith Form-a-Truck

THE MAXFER TON-TRUCK-MAKER

This chain drive unit is offered by the Maxfer Truck and Tractor Co., 2023 Michigan Avenue, Chicago, Ill., price \$350. It has a capacity of one ton. The unit heavy truck frame telescopes and reinforces the car frame, springs, axle, and all parts being strong to correspond. Heavy artillery type truck wheels, with solid tires and sprockets attached are driven from the Ford axle unchanged, used as a jackshaft. The Ford axle is used unchanged because of the use of the offset or bell sprocket, a new invention. The sprocket is of Baldwin special

analysis steel. The axle is heat treated, $2\frac{1}{4} \times 1\frac{3}{4}$ in. section, four roller bearings being used in the rear axle. The brakes are $12 \times 2\frac{1}{2}$ in. internal expanding. Chains are Baldwin roller, $\frac{3}{8} \times \frac{5}{8} \times 1$ in. The frame is 4 in. channel steel section reinforced in



Maxfer Ton-Truck-Maker

four places. The gear ratio is 7.1:1 on high and 18:1 on low. Loading space 9 to 11 ft. back of driver's seat and 4 to 6 ft. wide. The radius rods are of heavy steel, adjustable. Springs are 42 in., 10 leaves, semi-elliptic; relief spring 32 in., 6 leaves. The tires are $32 \times 3\frac{1}{2}$ in. solid or 32×4 in. to order. Tread is standard, 56 in. The wheelbase is 125 in.; weight of truck 2100 lbs.

and rear end of side springs. The lugs holding the radius arm swivels are dropped and held in place by a separate pin. This permits having the center point of jackshaft, the center point of swivel pin and the center point of rear axle in perfect alignment in order to equalize the strain on roller chains. The radius arms are one-

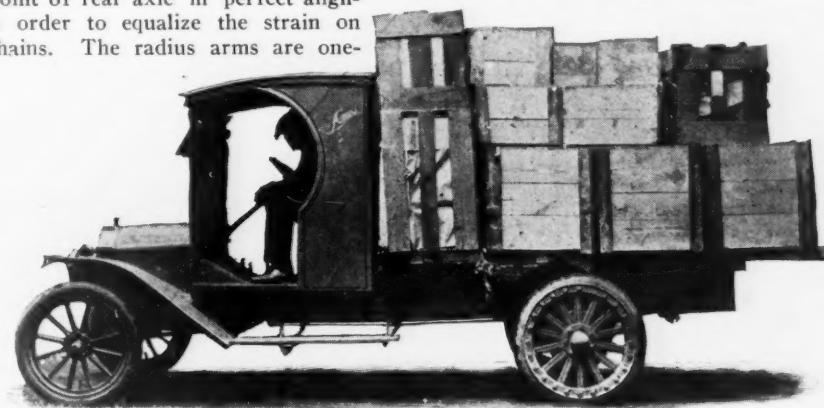
dirt and grit from getting at rear wheel bearings. Both jackshaft and rear wheel sprockets are cut from high grade steel blanks and are Baldwin make, as are the roller chains. The rear wheels are made of guaranteed hickory spokes and felloes and are equipped with Firestone $32 \times 3\frac{1}{2}$ in. solid rubber tires. The side springs are 2 in. wide, 44 in. from center to center of eye, fitted with bushings, and have 9 leaves. There is a relief or cross spring over the rear axle, bolted through drilled holes in the I-beam on the Dearborn frame. The rear dead axle is $2\frac{1}{4} \times 1\frac{3}{4}$ in., drop forged and heat treated, with a carrying capacity of $1\frac{1}{2}$ tons. The rear axle assembly of the Ford is cut down and converted into a jackshaft. The Dearborn frame is riveted to the Ford frame and makes a permanent proposition. It is as solidly constructed as standard one-ton trucks. It has a number of original features on which the manufacturers have applied for patents. The total weight of the Dearborn Truck Unit is 1000 lbs., while the total weight of the Ford-

DEARBORN TRUCK UNIT

The Dearborn Truck Unit for converting Ford cars into one-ton trucks is manufactured by the Dearborn Motor Truck Co., 1250-1264 South Campbell Avenue, Chicago, and sells for \$350.

Its frame fits the Ford frame snugly at the front, and does not necessitate cutting the Ford fenders to fit them around the dash, neither does the Dearborn frame bend in till after it passes the front step brackets, so that the four-step brackets are all of the same size. It has a specially designed jackshaft hanger on which patents are pending, which permits the use of the same size spring shackles on both front end

piece castings with adjustable swivel, and are held in place on the rear axle by a removable collar, which is screwed in place and is fitted with felt washer to prevent



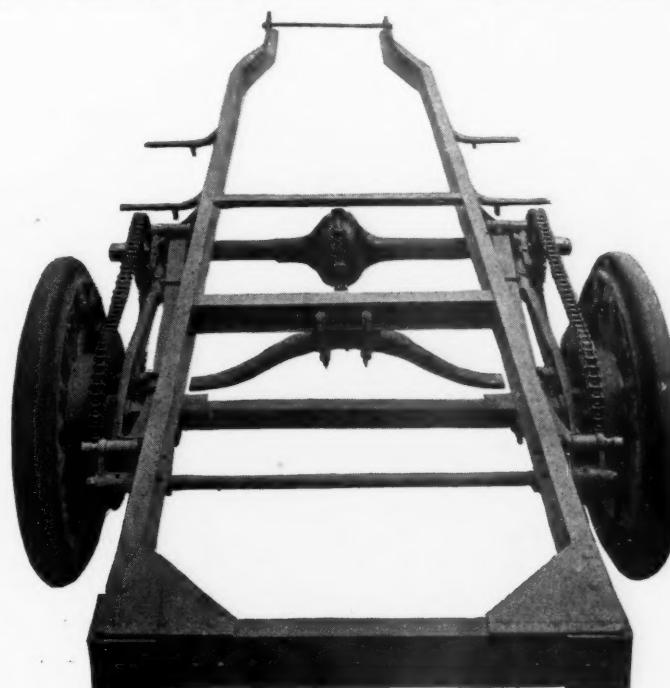
Ames-Ton Worm-Drive Unit

Dearborn chassis complete is 1840 lbs. The total length of frame is 14 ft., with a loading space of 9 ft. back of seat. The wheelbase is 125 in., gear ratio 7.5:1. The brakes are $12 \times 2\frac{1}{2}$ in., with 3-16 in. Brakebestos lining.

AMES-TON WORM-DRIVE UNIT

The Ames Motor Car Co., of Owensboro, Ky., is offering the Ames-Ton Worm Drive Unit. This has a worm drive rear axle geared 6.2:1, worm being of alloy steel and worm wheel of bronze, mounted on annular ball bearings. A tubular propeller shaft, with universal joint, is used. The frame is 160 in. long, 4 in. channel section, 3-16 in. thick, reinforced with gusset plates and cross members. Springs are semi-elliptic, 8 leaves, tires being $32 \times 3\frac{1}{2}$ in. solid. Brakes are $14 \times 1\frac{3}{4}$ in. internal expanding, shoes being malleable iron lined with thermoid and drums being pressed steel. The wheelbase is 120 in., tread 56 in. The loading space back of the driver's seat is 8 ft. 6 in. The weight of the unit is about 1100 lbs. As a truck it weighs 2000 lbs.

The thrust in the worm drive is taken by a double annular ball bearing, while the radial load is carried on a single and double row annular bearing. The worm, worm gear and differential can be removed from the housing as a complete unit. The price complete is \$395.

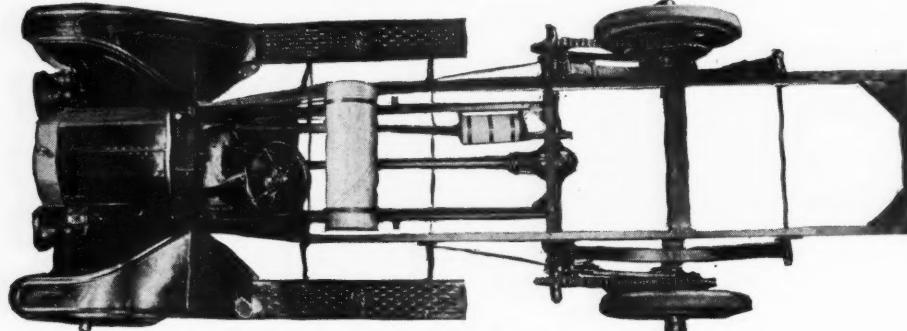


Dearborn Truck Unit

IOWA COMMERCIAL CHASSIS

A truck-type chassis portion, made to carry loads up to 3000 lbs., is made by the Iowa Motor Truck Co., of 313-17 East Second St., Ottumwa, Ia., and is designed to replace the rear drive portion of the Ford chassis, the Ford frame being used as a sub-frame. The Iowa Commercial Chassis is made to carry two capacities, 2000 lbs. and 3000 lbs. The differences are few with the exception that the axle and wheels on the 3000 lb. attachment are much larger and heavier.

The Model E, 2000 lbs., has internal gear drive, ratio of either 7:1 or 8:1. Drive to axle by tubular shaft with universal joint at either end. Springs are 2½ in. wide, 52 in. long and have 10 leaves. Brakes are external contracting, 14 in. in diameter and 2 in. wide. Spring shackle bolts ¾ in., case hardened, made with oilways. Wheels are 32 x 3½ in. artillery type with 1½ in. spokes. Tires 32 x 3½ in. solid.

**Union One-Ton Attachment**

Frame is heavy steel channel, corners reinforced with steel plates. Wheelbase 116 in., weight 925 lbs. and price \$375.

The Model O, 3000 lb. chassis has brakes 17 x 3 in., solid tires 32 x 3½ in., wheels with 2 in. spokes. Springs 52 x 3 in., with 10 leaves. Weight 1250 lbs. and price \$450.

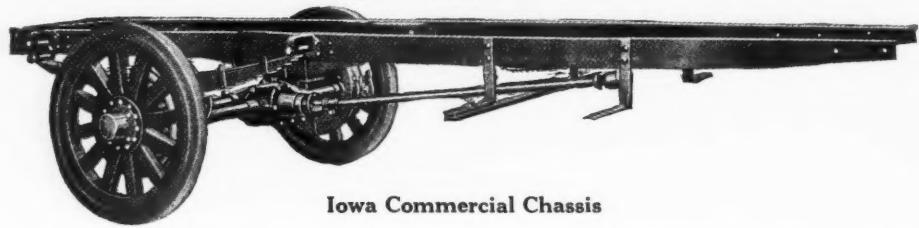
RAYFORD INTERNAL-GEAR UNIT

The Rayford Co., Second Street and Indiana Avenue, Philadelphia, has recently announced a new internal gear type unit. The Ford rear axle is used as a jackshaft, and remains unaltered, the axle ends being supplied with spur gears which mesh with special cast dished steel wheels. The internal gears of these steel wheels are made in six removable sections to facilitate repairs and cut down cost. The wheels are mounted on Bower roller bearings. The tread remains 56 in. standard. The tires are 32 x 3½ in. solid, and the load carrying axle is I-beam, 3 x 1½ in.

On this are mounted the heavy, long, flat leaf springs, which carry on the usual mounting the heavy channel section steel frame, the channel being 4 in. in depth. This extends the Ford frame so that the wheelbase is 124 in. The Ford axle itself is supported suitably to this load carrying I-beam axle at either side of the differential housing at center and at each end. This axle, of course, carries no load whatever, but merely acts as a housing covering the

live axle within it, which transmits the torque to the wheels, the same as is done in any internal gear drive axle construction. Although the outfit gives a standard tread of 56 in., it can be had in 60 in. tread for southern roads, if desired. The unit sells complete for \$300.

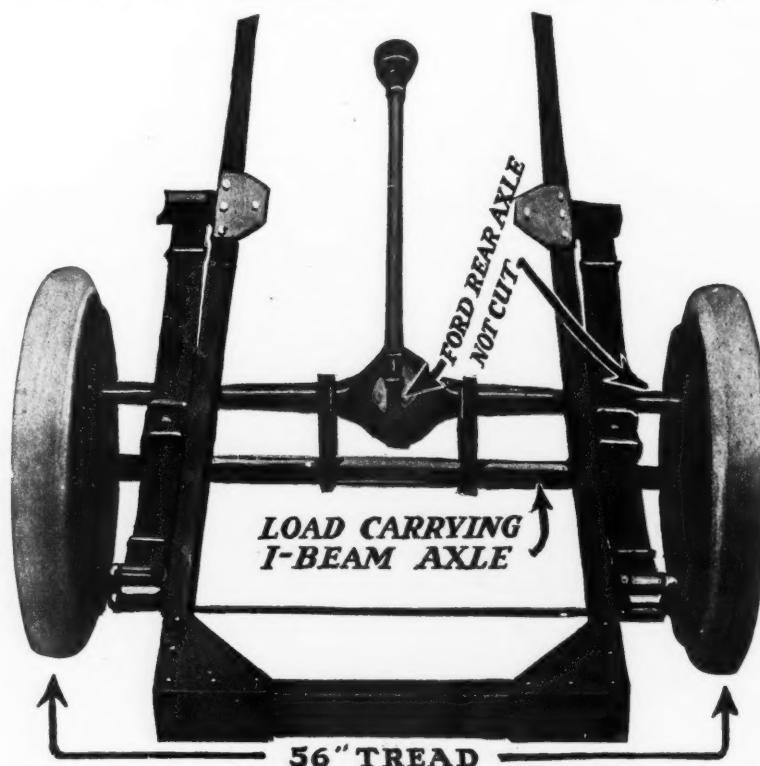
gear ratio is 7:1, and the emergency brake is internal expanding on the rear wheel brake drums. The wheelbase is 124 in., tread standard or southern. The speed is about 20 m.p.h. The rear of the assembly is designed so that nine-tenths of the load is carried by it.

**Iowa Commercial Chassis****RAYFORD CHAIN-DRIVE UNIT**

The Rayford Co., of Second Street and Indiana Avenue, Philadelphia, is offering a chain-driven unit to convert the Ford chassis into a one-ton truck. The price is \$300. The frame overall is 160 x 32 in. The axle is I-beam drop forged, 3 x 1½ in.

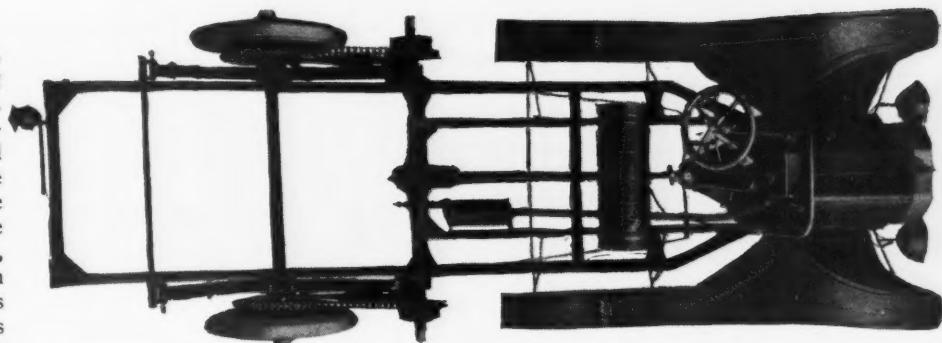
UNION ONE-TON ATTACHMENT

This outfit is offered by the Union Truck Mfg. Co., Inc., 250 West 54th Street, New York City. This Union attachment has a capacity of 2000 lbs., and chain driven from the jackshaft (formerly the Ford rear axle) to the solid rear axle 2½ x 1½ in., with standard roller bearings. The chains are Baldwin heavy roller type, 11¼ x 5/8 x ¾ in. The foot operated service brake is in the transmission and the emergency is located on the rear wheels and is operated by the side lever. The rear springs are 42 x 2 in., 10 leaves, with auxiliary over the axle. Rear tires are 32 x 3½ in. solids. The frame is 4 in. cold rolled steel, and the wheelbase is 125 in., tread 56 in., giving a loading space of 9 to 11 ft. long and 4 to 6 ft. wide. Standard gear ratio is 7:1 and the speed 20 m.p.h. Weight complete, 2100 lbs. If desired an 150 in. wheelbase can be had, different gear ratios and pneumatic tires on the rear. This unit, with Ford power plant, sells for \$720; separately it costs \$350.

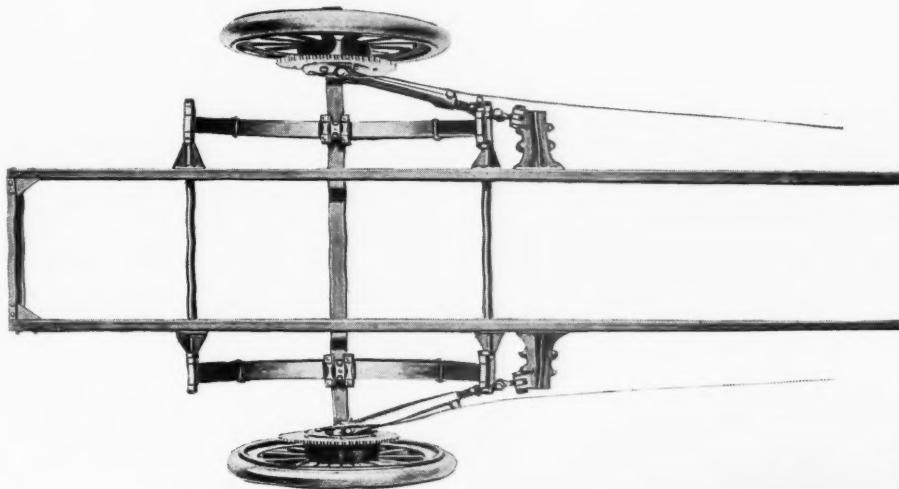
**Rayford Internal-Gear Unit**

TRUCKFORD

The Robinson Machine Co., of Detroit, offers the Truckford Unit for converting the Ford chassis into a 1-ton truck chassis. Price \$350. The weight of the unit detached is 875 lbs. The frame is 4 in. rolled steel channel, amply reinforced. The springs are 48 x 3 in. semi-elliptic. The axle has a diameter of 2½ in., and tires are 32 x 3½ in. solid. The gear ratio is 6.98:1, on direct drive. Drive is by double chain 1¼ x 5/8 x 5/8 in. Wheels have 2 in. spokes and run on Timken roller bearings. Radius rods are adjustable, and brakes are 14 x 2 in. expanding on rear wheel drums. Standard brake lining. Wheelbase is 128 in.; tread is standard. Loading space is 8½ to 11½ ft. according to style and length of body.



Truckford Unit



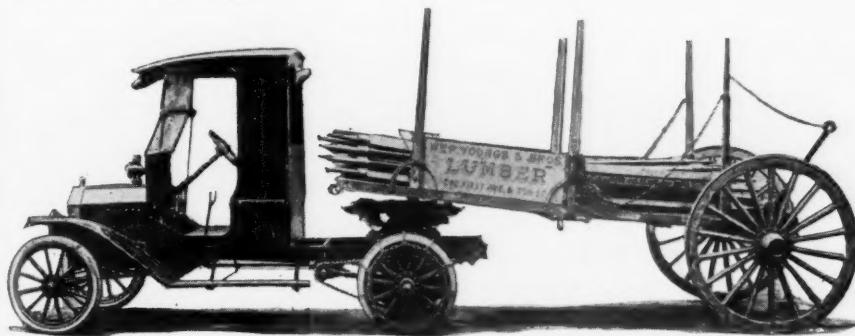
Redden Make-A-Truck

JEWETT TRUCK ATTACHMENT

The Jewett attachment for converting the Ford chassis into a truck is offered by the Jewett Car Co., of Newark, Ohio, price \$375. This is known as Model A, and has a capacity of from 2000 to 3500 lbs., final drive being by internal gear. The wheelbase is 118 in., rear tires are solid, 34 x 3½ in., or pneumatic 34 x 4½ in. Driving propulsion and driving torque are taken by the springs. The rear springs are 54 x 3 in., semi-elliptic. Wheels are of wood. The gear reduction from engine to rear axle is 7.4:1. The price includes the unit assembled, and includes running boards, footboards, footboard sides, rear fenders and brake rods.



Jewett Truck Attachment



Union Tractor Unit

UNION TRACTOR UNIT

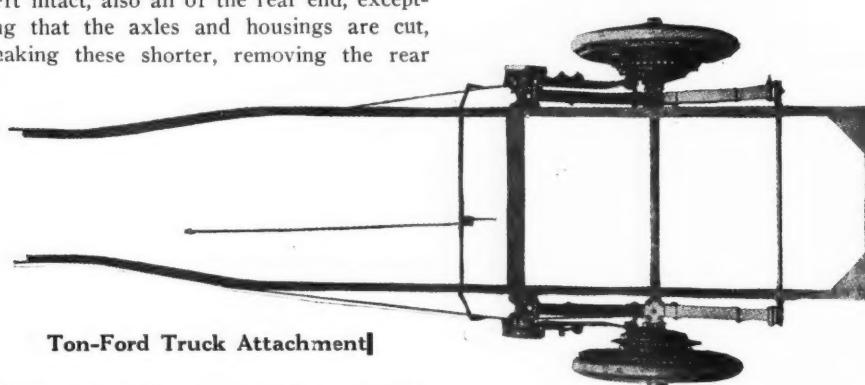
This 3-ton tractor unit utilizes the forward portion of the Ford chassis and is chain driven from the jackshaft, formerly the Ford rear axle. This outfit is offered by the Union Truck Mfg. Co., of 250 West 54th Street, New York City, price \$375. The wheelbase attached to the Ford is 110 in. The gear ratio is 9:1 and the hauling capacity 6000 lbs. Drive is by heavy roller tractor type chain, and the speed is approximately 12 m.p.h. The frame is made of rolled steel, side springs being semi-elliptic. There is also a tractor auxiliary spring over the rear axle. Wheels are artillery tractor type, 32 in., equipped with Goodyear S. V. solid rubber 3½ in. tires. Brakes are internal expanding tractor type on rear wheels controlled by lever.

TON-FORD TRUCK ATTACHMENT

The Woodward Truck Attachment Co., of Pico and Alvarado Streets, Los Angeles, Cal., is offering the Ton-Ford truck attachment at \$350. This is a chain drive unit with a capacity of 2000 to 2500 lbs., and wheelbase of 124 in. The speed of the truck is 18 m.p.h. Drive is by Whitney roller chain from the shortened Ford axle, which is used as a jackshaft, to the truck axle, a solid one-piece drop forging of 35 point carbon steel, size 2 x 2 in., equipped with large Timken bearings. The internal expanding lined service brakes operate on the rear wheel drums by the action of the foot pedal, the side lever operating the emergency brakes on the jackshaft. The frame is 4 in. heavy channel section steel, and springs consist of two side 2½ in. semi-elliptic and cross-helper springs. Wheels are extra heavy and tires are 32 x 3½ in. solid Firestone. Gearing is 6:1 or 7:1.

This attachment has a complete frame without the front cross member, allowing it to slip over the Ford frame up to the radiator, and by bolting to the Ford frame leaves the Ford frame a sub-frame carrying an engine only.

The Ford engine and transmission are not disturbed or changed, the drive-shaft is left intact, also all of the rear end, excepting that the axles and housings are cut, making these shorter, removing the rear

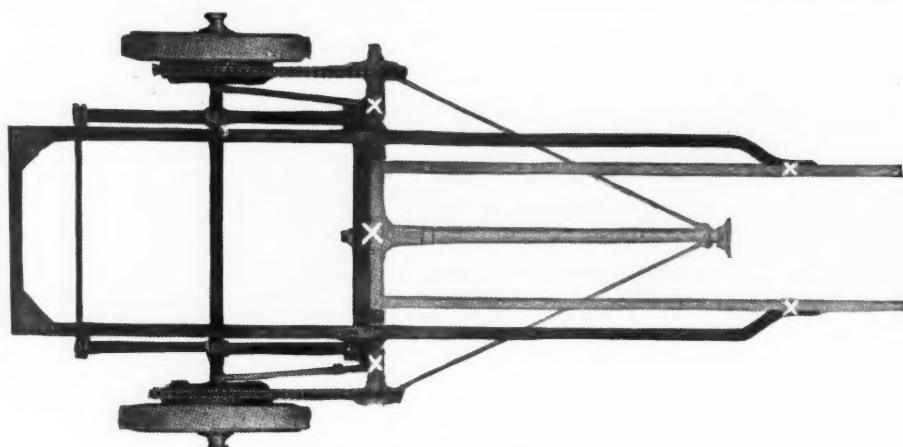
**Ton-Ford Truck Attachment**

wheels and putting on sprockets in their place, from which chains are run to the rear truck axle sprockets, making a double chain drive. The Ford rear wheels are used in front, making the front wheels 30 x 3½ in.

Back of the seat the frame is 8 ft. long and 34 in. wide, and by overhanging a body 9 ft. long and 4 ft. wide can be used. If a wider body is desired it can be arranged by raising it and building over the wheels.

HUDFORD MODEL A

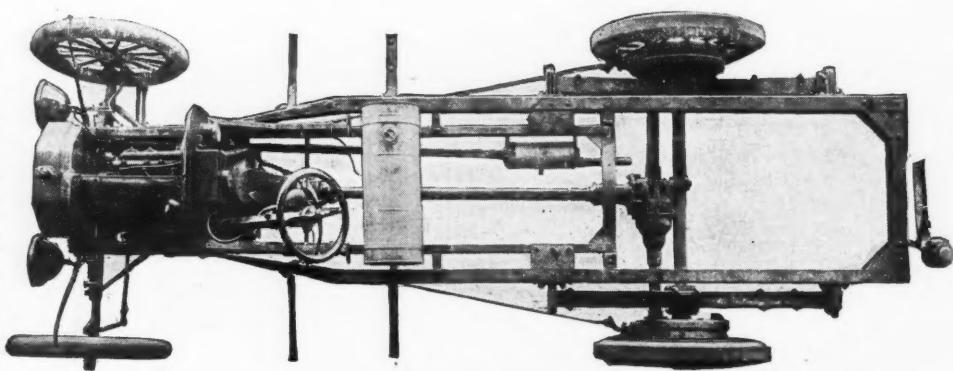
This unit, offered by the Hudford Co., of 1410 Wallace Street, Philadelphia, has a carrying capacity of one ton, the rear axle being of the internal gear type and the wheelbase 112 in. The price is \$360. The Hudford frame extends 52 in. beyond the rear of the Ford frame. This unit frame is attached to the Ford frame by cross frame members. The unit outfit consists of the auxiliary frame, the internal gear rear axle and the drive shaft, springs, brake drums, etc., being included, and doing away with all the corresponding parts of the Ford except the Ford frame. Nine-tenths of the load is carried on the rear axle so that the

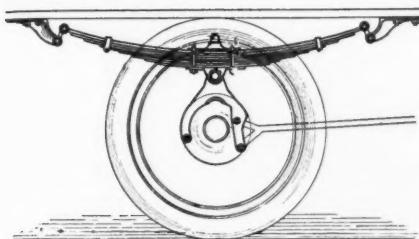
**Simplex Truck Unit****SIMPLEX TRUCK UNIT**

The Simplex Truck Co., 115 South Dearborn Street, Chicago, Ill., is manufacturing a double chain drive assembly that is claimed to be of sufficient strength and design to carry 50 per cent. overload. The makers lay particular emphasis on the fact that the truck unit may be readily attached as there is no change in the Ford frame or axle. The 4 in. channel steel frame is secured to the Ford chassis by means of five quick action clamps and the Ford rear wheels are replaced by two small sprockets connecting the truck axle with double side chains. Specifications are as follows: Carrying capacity, 2000 lbs.; frame, 4 in. channel steel 34 in. wide; axle, 1¾ x 2 in.; springs, semi-elliptic, 2 x 44 in.; tires, solid rubber, 32 x 3½ in.; sprocket ratio, 31-63; drive, Baldwin double chain; brakes are double emergency, wheelbase 127 in., weight 1000 lbs. The price is \$325.

WRIGHT TRUCK ATTACHMENT

The Wright Truck Attachment Co., of 1718 Broadway, Seattle, Wash., is offering the Wright Truck Attachment for converting the Ford chassis into a ton truck. The rear is strongly made, and has solid tires, drive being from jackshaft to the Timken rear axle by chains. This unit is so designed as to carry over 90 per cent. of the load. The gear ratio is 8.29:1, and the wheelbase is 122 in. The price is \$350.

**Hudford Model A**



Camelford Attachment

CAMELFORD ATTACHMENT

This outfit, which is designed to reinforce the rear of the Ford to give satisfaction in the carrying of heavy loads, is made by the Maremont Mfg. Co., 916 South Wabash Avenue, Chicago, price \$40. It strengthens the rear end of the chassis and makes possible the use of a 7 ft. body.

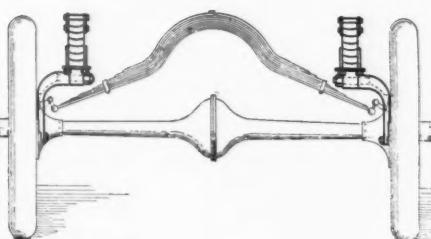
One illustration is a side view of the Ford rear axle and wheels equipped with a Camelford. The horseshoe shape yoke is attached to the end flange of the housing through the two bolt-holes of the radius rod on one side and the hole for the brake band stud on the other side. The upper end of the yoke bends rectangularly toward the longitudinal axis of the chassis. On this end is attached the spring chair, spring and pad. The half elliptical springs connected with shackles and hangers are attached to the sills of the body.

The other illustration is a rear view of the Ford rear axle and wheels equipped with the Camelford and supplements the side view and description above. Note particularly how the Camelford transforms the inadequate one point rear spring support of a standard Ford chassis into a full platform support; also note the sturdy construction of the yokes.

THE H-D EXTENSION FOR FORD CARS

To provide loading space back of the driver's seat for commercial usage, the Hayes-Diefenderfer Co., 237 West 55th Street, New York City, is making a Ford rear extension designed to lengthen the standard chassis without weakening the car. It is stated that the increased wheelbase permits carrying a profit-paying load of light, bulky parcels without raising the normal weight capacity.

The frame extension equipment consists of a frame section, a propeller-shaft exten-



sion, a tubular propeller-shaft housing extension and the necessary equipment for lengthening brake rods, nuts, bolts, etc. The H-D extensions are made in two sizes. One to increase the wheelbase 15 in., from 100 in. to 115 in., price \$55. The other increases it 30 in., from 100 in. to 130 in.; price is \$60. The company also makes a seven-passenger detachable Ford tonneau that can be fitted to any 1915 or 1916 Ford runabout.

wheelbase, is made of 40 to 50 point carbon steel. The frame is lengthened by the use of two pressed steel side frames driven over the old frame and fastened with hot rivets. In addition the under part of the frame is strengthened by a heavy truss rod on each side. A truss rod is also placed under the rear axle and the rear spring is strengthened by adding two extra spring leaves, a new center bolt and fittings.

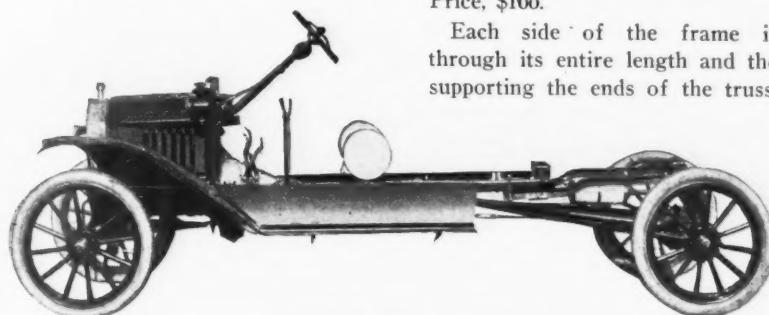
A complete set of parts are supplied as follows: Two extension side frames, two spring leaves, four rear spring clips, one rear axle truss rod, one shaft extension support, one Longford extension drive shaft set, two running board brackets, one running board brace rod, two standards for side frame truss rods, two side frame truss rods, two brake rod extensions, two side mud pans, two running boards, one tail-light bracket, 15 cotter pins, one rear spring hanger, 35 rivets and 36 bolts.



Forbes Complete Frame

LONGFORD AUTO PARTS

The Motor Accessory Distributing Co., 87 Haverhill St., Boston, Mass., is offering the Longford Auto parts, installed for



H-D Extension (30 in.)

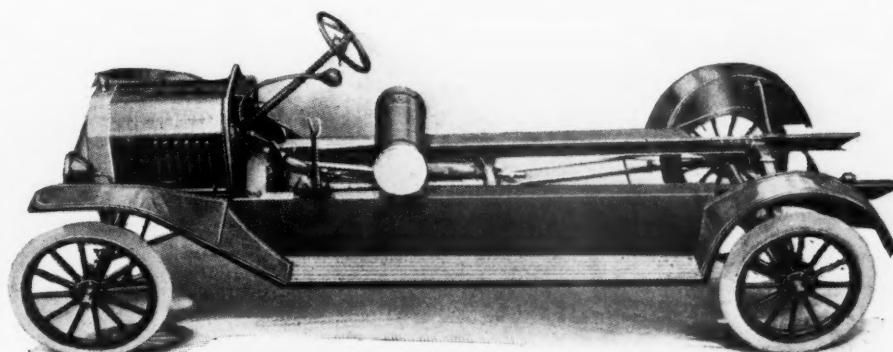
\$125. These parts are designed to convert the stock Ford chassis into a truck providing a loading space of 8 ft.

The patented extension drive-shaft of 3 ft., which lengthens the car to 136 in.

specially designed to clamp around the ends of the frame, making it unnecessary to bore any holes in the frame. The chassis is thus strengthened and stiffened to a wonderful extent.

The lengthwise members of the extension section are steel channels, and between them the cross member of cast steel is so arranged as to carry the thrust of the drive shaft. In this way the engine is relieved of this thrust and allowed to deliver its full power to the driving of the car. The intermediate shaft floats between the engine drive plate and the universal coupling and transmits the power in a direct and positively efficient manner.

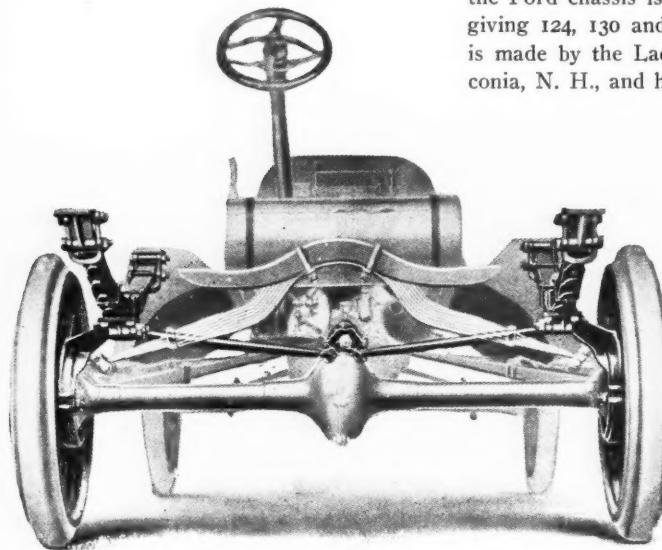
This extra length enables a body being used which will exactly fit the demands of many businesses which heretofore have been compelled to use heavy trucks.



Longford Parts Attached

OLSON CONVERTING UNIT

The Olson Converting Unit is offered at \$65 by the Swedish Crucible Steel Co., of Detroit, Mich., the outfit consisting of Olson steel wheels and springs, radius rods and all other necessary parts for attaching. The purpose of this outfit is to enable the Ford chassis to carry heavy

**Olson Unit Attached**

loads with safety, these parts bearing the brunt of the load. The working principle of the Olson Unit is to take the load onto the auxiliary springs and deflect this into the steel wheels, in the housings of which are mounted roller bearings independent of the Ford axle. The axle is transformed into practically a full-floating type, and the energy from the engine back, though the transmission and differential is free to pull the load, rather than do this and be burdened with the friction from the load strain. The capacity is 1 ton, but these units are claimed to have carried 5 tons.

XTEND-A-FORD OUTFIT

This outfit is designed to lengthen the present Ford chassis either 15 in. or 30 in., as desired, and with it is supplied all necessary brake rods, running-boards, a pair of rear commercial fenders, etc. It is made by the Xtend-A-Ford Co., of 1416 Wallace Street, Philadelphia, the prices being \$67.50 for the 15 in. extension and \$75 for a 30 in. Drive is by shaft, all parts necessary for lengthening it being supplied. With the chassis extended this extra length it is designed to have a commercial body mounted on it. The capacity is approximately 1000 lbs. The complete outfit consists of shaft to connect the propeller shaft to the transmission; bearing plate for the end of the transmission, propeller-shaft extension of the transmission, propeller-shaft extension with universal joint, cross frame member for the front end of the rear construction, running boards, aprons, running-board truss, right and left frame extensions, rear

commercial fenders, extension for brake rods and all necessary bolts and nuts. The Ford parts dispensed with are the rear fenders, running-boards and shields.

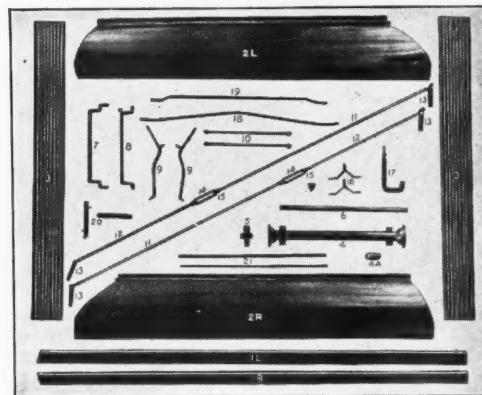
P. B. B. ASSEMBLY

The P. B. B. Assembly for lengthening the Ford chassis is offered with extensions giving 124, 130 and 136 in. wheelbases. It is made by the Laconia Truck Co., of Laconia, N. H., and has a capacity up to 1500

be given in a coming issue of this magazine.

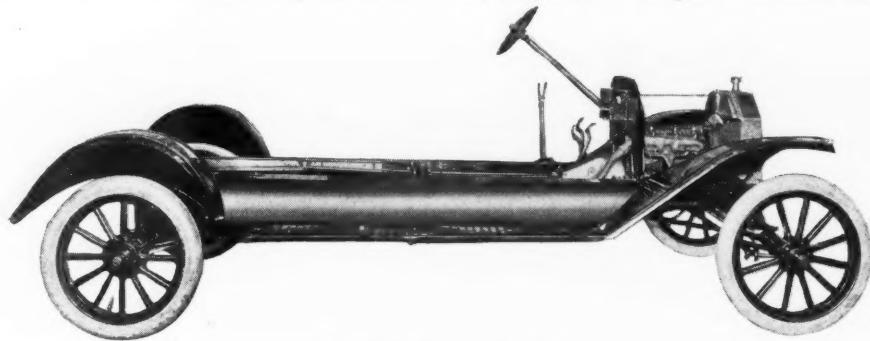
SIX MONTHS' TUNGSTEN PRODUCTION

The Tungsten production of the United States during the first six months of 1916 exceeded the production of this or any other country in any previous twelve months. Prices were even more phenomenal than production and reached more than ten times their ordinary level. The output was

**P. B. B. Assembly Parts**

lbs. This equipment makes use of two universals in the drive shaft, both of which are standard. The drive is by shaft, en-

equivalent to about 3290 short tons of concentrates carrying 60 per cent. WO₃, valued at \$9,113,000, according to an estimate made

**Xtend-A-Ford Attached**

tirely enclosed. The frame is extended by inserting two channel iron extensions. All nuts, bolts, rivets, washers, etc., are included in the price. The principal parts furnished are the frame extensions, splash pans, running boards, housing, babbitt bearings, knuckle joint, jackshaft, cross frame members, running board brackets, stay rods, truss rods, and brake rods supports.

by Frank L. Hess, of the United States Geological Survey, Department of the Interior. Statistics are valuable only so far as their accuracy is known, and this estimate is believed to be correct within 10 per cent. and to be under rather than over the true figures.

These figures are no less noteworthy when it is known that in 1915 much the larger part of the production was in the second half of the year, so that the total domestic output for the twelve months ending June 30, 1916, probably amounted to about 5000 tons.

From Nevada 461 tons, valued at \$1,432,000, and from Arizona 175 tons, worth \$565,000, are estimated to have been shipped. Smaller quantities were mined in Alaska, Connecticut, Idaho, Missouri, New Mexico, South Dakota, Utah and Washington.

NEW ROTHWEILER UNIT TO BE READY SOON

Rothweiler & Co., 1830 Broadway, Seattle, Wash., maker of the well-known Rothweiler one-ton truck attachment for converting the Ford chassis into a truck, announces that it is about to place a new model truck unit on the market. No details are yet announced, but these will

TRACTOR DEMONSTRATIONS DRAW FARMERS

With an attendance estimated at 15,000 to 20,000 farmers and merchants from every section of Texas, Oklahoma, Arkansas, Louisiana and New Mexico, the Southwest national tractor demonstration opened officially July 18th at the Caruth farm, four miles northeast of Dallas, Tex. Manufacturers who have exhibited at these demonstrations since they were started three years ago were unanimous in their statements that never before have they seen such an array of power farming machinery, such good attendance on the opening day or so much real interest displayed by the visitors. It was considered assured that the attendance during the four days of the demonstration will go far beyond 100,000.

Visitors began arriving on the field as early as 7 o'clock in the morning. They came in from all sections of the Southwest on early morning trains, going to the demonstration grounds by the hundreds in special interurban cars over the Texas Traction Co. line. Many of the visitors came in automobiles and cars were seen upon the grounds from Arkansas, Louisiana and Oklahoma, as well as from all parts of Texas. Several thousand cars were parked on the grounds at one time during the day.

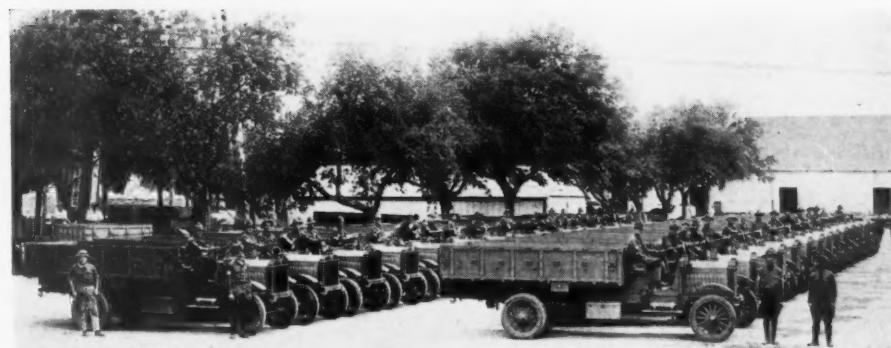
O. J. CHILDS COMPANY BRINGS OUT NEW FIRE-FIGHTING EQUIPMENT

The apparatus illustrated herewith has been designed to satisfy the needs of any small village or town desiring an adequate fire-fighting outfit. The apparatus is built by the O. J. Childs Co., of Utica, N. Y., and is mounted on a Buick 1-ton chassis. This company is prepared to mount this outfit on any type of chassis desired and is especially desirous to work in harmony with local car dealers, to either furnish the chemical tanks and equipment and allow them to equip the truck and finish it complete or to have the chassis shipped to its factory and finish the whole job complete.



Utica Fire Apparatus Mounted on Buick One-Ton Chassis

The fire-fighting apparatus consists of hose body; two 35 gallon chemical tanks, connected with hose reel with 200 ft. of $\frac{3}{4}$ in. chemical hose; two hand extinguishers; four fire department lanterns; one 24 ft. extension ladder, one 12 ft. roof ladder with folding roof hooks; fire pole; fire axe; canister for carrying extra chemical charge. The truck is equipped with electric starter, electric lights; and painted a bright vermilion red, striped with silver, and the tanks and parts are nickel plated. This makes a very complete outfit and well within the means of any village fire department.



Riker Motor Truck Company of United States Army
Passing inspection at Fort Sam Houston, San Antonio, Texas, prior to loading supplies for the advanced military base

ARMORED TRUCK PRESENTED TO STATE MILITIA BY REO MOTOR TRUCK COMPANY

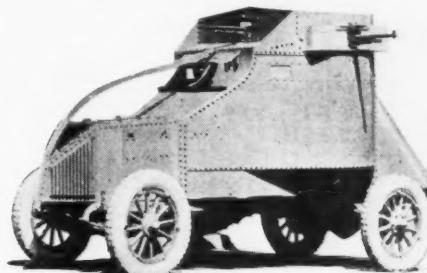
"While the Reo Company is not in any way belligerent nor eager for any kind of war orders, either foreign or domestic, nevertheless it has, like many other patriotic citizens, made a study of the various implements of war, and especially such of them as naturally come within its immediate sphere," said Horace T. Thomas, chief engineer of the Reo Co., and designer of the armored truck which was recently presented by the Reo Motor Truck Co. to the Michigan State Militia.

Lightness and speed are among the requisites kept in mind while designing this truck, and so this Reo war truck, which has room for four machine guns and their operators, beside the chauffeur, weighs only 4200 lbs. complete, and is capable of speed up to 35 miles per hour.

An interesting feature of the machine is the thinness of the plate with which it is armored. Looking at it superficially, one would naturally suppose that the plate must be at least half an inch thick, and therefore be very heavy. As a matter of fact, in making experiments, it was discovered that the modern high velocity rifle steel coated ball would easily penetrate a half inch of case-hardened steel, and, for that matter, much greater thicknesses. After experimenting for some time the idea

was conceived of using two thin plates of steel separated by an air space, and when we did that a peculiar phenomenon was witnessed.

The same rifle ball shot at a plate a fraction over an eighth of an inch thick and separated from another plate by about three-eighths of an inch, penetrated the first



The Reo Armored Truck
A double-plate armor is the interesting feature of this outfit

plate but was stopped by the second one. The answer is simple—the impact against the first plate flattened the bullet so that it was easily stopped by the second one.

While capable of turning any rifle or machine gun bullet, this truck is also very light and therefore speedy.

For actual warfare conditions steel discs may be added to the wheels to protect the spokes. The curved steel bar which extends from the radiator to the point above the driver's head is designed for cutting barbed wire entanglements.

PROPOSED MOTOR 'BUS SERVICE IN BERMUDA

According to Consul Carl R. Loop, of Hamilton, the legislative assembly of Bermuda has decided to repeal the present act prohibiting the use of mechanically propelled vehicles of all sorts, and has appointed a committee to draft a bill providing for "a restricted motor bus service under the control of the local government." It is probable that a bill, drafted in accordance with the motion, will pass both the assembly and the legislative council, in which case a motor bus service, under prescribed restrictions, will be inaugurated between Hamilton and St. George and between Hamilton and Somerset.

Buffalo's Freight Terminal Problem

By GEORGE W. GRUPP

BECAUSE of the great congestion at freight terminals, J. J. Hill once said, freight cars are only able to average 20 miles a day. Therefore, this subject is worthy of considerable thought, and especially so because motor trucks are vitally affected by this problem. Congested terminals and poor facilities to handle freight within these terminals is a detriment to the progress of the motor truck idea and the efficiency of it. And as Buffalo is no different than other cities—the truck idea is proportionately retarded here.

However, the freight terminal situation in Buffalo is apt to be different than it is in other cities. Here, nearly all of the big wholesale houses, commission houses and manufacturers are situated, either on the border of the railroad tracks or very nearby. This, of course, means that trucks are not as popular with these firms as they would be if conditions were different. Nevertheless, with smaller business men and others whose place of business is some considerable distance from both railroad tracks and freight house, the relationship of the motor truck and freight terminal is more close. And from their point of view and experience let us look at Buffalo's freight terminal question.

In order that one might get a glimpse at the situation it would be well to observe and take note of the actual experiences of some of the local truck users.

Delays at Freight Depots

The writer observed that one of Kulp & Sons' 5-ton Pierce trucks, which was not delayed in the slightest in finding a place along one of the local freight house platforms, had to wait five minutes to have the freight house delivery clerk deliver to him one barrel of sugar. To load it required but a minute. But he had another barrel to get. For this he had to wait ten minutes. All totalled it took him seventeen minutes to load and wait for two barrels of freight, and his engine was running all this time. Therefore, it is not surprising in the least to find that mo-

tor trucks are an expensive proposition around freight houses.

Two Hours Waiting

But that experience is not the most startling,—H. F. Guhl's 3-ton Standard with a load of furniture had a more blood-curdling experience. This truck arrived at one of the local freight houses with a load of household furniture at 10:30 A. M. The writer followed this truck through the following experiences. In the middle of the street it was compelled to stand until 10:40—waiting for the receiving clerk to decide whether it should be loaded directly onto a freight car or unloaded into the freight house. At the time last stat-

which was located three blocks away. But when he told the driver this he did not know where the car was exactly located. For this information he had to wait seven minutes. Then after having driven to the car, he had to wait until 12:15 P. M. for receiving clerk to tell him that he had stopped in front of the correct car and that he could now unload. And with the aid of two men, not railroad employees, he unloaded the truck in thirty minutes. In other words, two hours and fifteen minutes were consumed in the waiting and unloading of a truck of furniture. And had he not unloaded the freight himself another hour's time would have been lost.



Note the Tangled Condition

Seen from the top of a freight car when conditions are not at their worst

ed, the driver was told to unload at the freight house. Fortunately he soon found an opening, and here he stood backed up against the freight house door until 11:05 A. M. Then the receiving clerk told him to drive to the railroad company's scale, which was several blocks away, to have the freight weighed. Therefore, the driver was compelled to drive to the scales and lose his place at the receiving platform. By 11:12 he was back again and then for three minutes he waited for another opportunity to back up to the platform. When he had backed up and had been there but a minute, the receiving clerk changed his mind and ordered the driver to drive to an empty freight car,

Here are some other time experiences which the writer noted. Some are more favorable than others. All of the more ideal experiences only occurred where the conditions were ideal, that is as ideal as it was possible. He found that it took ten minutes before one railroad would accept two packages from a Buffalo Bag Company's truck. It took another truck two and one-half hours before it could deliver a 500 lb. casting to the railroad. The General Carbonic Co. was able to unload 50 gas tanks in twelve minutes. The Cataract Refining & Manufacturing Co.'s truck was able to load 35 iron oil barrels in ten minutes. The Iroquois Brewing Co.'s truck loaded 210 boxes, 2 dozen cases, in ten minutes with the aid of two men and the driver. Again E. C. Peglau, who carts for the Buffalo News Co., loaded 200 bundles of magazines (24 magazines in a bundle weighing 30 lbs.), in ten minutes with the aid of two helpers.

Too Much Red Tape

All of the foregoing experiences prove what can be accomplished under both favorable and unfavorable conditions. But the thing that interests one most in this problem is the causes for delay. Many are they, and all could be corrected if the railroads and truck owners would be willing to stop and think about it for a few minutes. In the first place, there is too much red tape connected with freight



Another View of the Same Scene

This picture shows the trucks and wagons in a more orderly condition

houses. All of this takes time and thus the truck is laid up for an unnecessary period of time.

Then again, there are too many bosses. It appears as though there were six bosses to every workman in the freight house. This excess of bosses causes confusion. One wants the freight to be unloaded here and the other there. As a result, the truck driver has to wait until they get through with their chronic quarrel and until they know what they want. The whole trouble with a great many of these bosses is that they lack definite decision. And because these bosses lack in this particular the truck owner has to pay the price.

The bosses are not the only ones to cause freight-house congestion and confusion and which ultimately make the truck inefficient; but the workmen under these bosses are equally to blame. Most of these men who receive the freight are paid by the hour, as a result their attitude is—"Let the cartman wait, we are not in a hurry." Then, on the other hand, those who load freight cars are usually paid on tonnage. These workmen are particular what they load. They don't like to load furniture, produce, eggs, cheese and other light and bulky freight; they prefer iron, steel, sugar, oil and the like. As a result the light, bulky freight has to be put off until the last and thus the freight house soon becomes clogged up. What does this mean? The drivers outside who are waiting to deliver freight have to wait until there is room to receive it or until the receiving clerk can find a checking clerk to check and inspect each item that the driver brings.

Narrow Streets

Another cause for congestion at terminals is the narrowness of the streets which approach and surround freight houses. This means that all vehicles must move slowly and carefully. Everyone seems to be getting in the way of someone else. And such a thing as traffic regulations does not exist down in the freight terminal colony. Confusion reigns supreme. Only the cartman who is the cleverest driving acrobat can move with any great degree of progress.

But this narrowness of streets is not the only reason why these streets are almost continuously clogged up, because the construction of the freight houses helps to increase this street congestion. A good many of the Buffalo freight houses are as old as Methuselah. The bricks of their walls have long been decorated with hieroglyphics chiseled in by the wind and rain, while the cement between them is slowly

dying of old age. Their interiors are as gloomy as sin and the floors are musty with age. Therefore, why should one become alarmed when one hears that the freight house workmen lack "pep"? The loading and unloading platforms are 20 to 30 ft. apart. Thus only one truck can back up to freight house every 20 or 30 ft. In some cases three trucks try to back up to the same small door. One backs up perpendicular to the door while the other two form two legs of an acute angle. And when they begin to unload or load each

him. And while he is quarreling with the receiving clerk a score or more cartmen are waiting for him to move away from the door in order that they might also unload.

Again, the shippers and truck owners are responsible for this congestion because they leave freight house deliveries go until the last minute. And then everyone wants to get to the freight house at the same time. Most freight houses are fairly taken by storm each day between the hours of 10 and 12 A. M. and 4 to 6 P. M. In fact, some railroads have gone so far, at times, as to refuse to accept freight after 5 P. M.; or from anyone who could not show a ticket that he was at the freight house before 5 P. M. Then again, it would not be fair for truck users to ask the railroads to hire a larger force of freight house men, because after these rush periods work is rather slack. What the shippers and truck owners ought to do is not leave things until the last minute. They ought to spread out their freight house deliveries.



An Ideal Way to Build a Delivery and Receiving Platform

Note the continuous procession of doors; also note the square signs hanging over the door, which tells where Smith & Company's freight may be found



Another View of the Same Freight House

This view is looking toward the freight cars

gets in the way of the other. Thus, confusion and lost time.

Thus far the charge has been made that the railroads are responsible for terminal congestion, but lest one forgets it might be well to add that the shippers, truck owners and users are also responsible. A shipper should always pack his goods as required by the railroads. And the cartman should not accept a box of freight from the shipper if it is roped; neither should he accept freight which is not properly tagged. If he does not, then when he gets to the freight house trouble is always in store for

Also, congestion might be avoided to a certain extent if the drivers would only help the freight house men a bit. Some of these drivers would sooner sit on a box of dynamite smoking a cigarette than help find their freight or help unload it. And as one driver said to the writer, "I am not paid to handle freight. I am paid to drive a truck and not do the work of a freight house handler." If he did, it is possible that he might strain his little toe or soil his fingers. And the way some of them dress, some that the writer saw, it is not to be wondered at when they say they do not want to handle freight. They are dressed to go to a ball or picnic, not to handle greasy oil barrels. They had better do a hard day's work when they begin to think too much of themselves.

Helpful Suggestions

After all this criticism a few suggestions would be beneficial. How to improve these frightful conditions is vastly more important. In the first place, hand trucks should be gotten rid of. It is estimated that railroads lose annually \$80,000,000 by employing these hand trucks. If storage battery industrial trucks were used instead more work could be accomplished. One of these trucks can easily replace two men and travel four times as fast as a man. Therefore, from a point of view of efficiency, they are as necessary to railroads as they are to the motor trucks as an auxiliary.

Then again, the railroads could build their terminals much longer than they do.

At present they build them from 15 to 20 freight cars length. As land is not so precious in Buffalo as it is in New York City there is no reason for their being so stingy. But should they not care to build longer terminals then why don't they build more freight houses and scatter them over Buffalo? Some should be located at Black Rock, at which point there is one; at East Buffalo, at South Buffalo, North Buffalo and other points along their line, from

And besides it is not all tangled up with someone else's. Thus the driver is able to get quicker service and a quick getaway.

Other things the railroads might do to help correct this present problem would be to forget some of their red tape; ask some of their bosses to put on overalls, and have men on the job who know what they want and who can give the driver a definite decision as to where to unload or to get his wares.



A View of One of These Ancient Platforms This helps in making congestion an actuality

which point considerable shipping is done or received. Under such conditions the trucks would not have to huddle in one place as they do now. The traveling distances would not be so great and the congestion at the terminals would be very much less.

Also, the railroads should take advantage of the idle space between the doors. If they would but only utilize this space by converting it into a continuous procession of doors and platforms more trucks could then back up to the freight house and be attended to very much more quickly. Again, if the railroads do not wish to make continuous doors in these old structures, then they could at least build a continuous platform so that the drivers could unload onto these instead of directly into the freight house.

Now in the sorting of goods in the freight house, goods which were received for Buffalo business houses, a little more system could be used. Nearly all of the local freight houses classify the freight alphabetically. In other words, all firms whose name begins with "A" will be found in one particular section. The improvement which the writer has in mind is one which is used by the Lehigh Valley's new Buffalo freight house. In this terminal, the big firms have specific places in the freight house. A fair-sized sign hangs on the wall over their special locations. With such a system, all the driver has to do is to back up to the platform, tell the delivery clerk he wants his goods, and then begin loading his freight himself if he happens to be ambitious enough. With such a system no time is lost in looking for one's freight.

Then, on the other hand, truck owners should see to it that their drivers co-operate with the freight house men. They should not hesitate to roll up their sleeves and do a man's work. By such co-operation, a

the men might object to system such as suggested, but one thing is sure, the railroad could improve on the idea or possibly improve on their present system.

And last, the city police might be of valuable assistance. They could make drivers adhere to traffic regulations. They could insist that the drivers stand in line. Thus, those who come first are served first. And as one truck leaves the platform the first truck in line is permitted to take his place at the platform. Then also the drivers should only be permitted to enter the street at one end and leave at the other. Make it a one-way street. As conditions are today they enter at either end and when they get about in the middle of the block they get all tangled up. At present wagons and trucks are standing everywhere awaiting an opportunity for an opening onto a platform.

Those that drive too far often miss an opening because they cannot turn around fast enough to get back. Thus much valuable time is lost by having no system. With a traffic officer on duty and some traffic regulations, as suggested, rigidly enforced, the confusion would be less, time would be saved, and the congestion which now prevails would be lessened very much.

Therefore, the foregoing demonstrates, if it demonstrates anything, that Buffalo has a real terminal problem to solve, and that both railroads and truck owners and users are proportionately responsible for the present condition of affairs, also, that both must work in harmony along some of the lines suggested, or similar ones, if a real solution to this ever-trying problem is to be found.



The Iroquois Brewing Company's Truck
This truck was able to load 210 cases in ten minutes.

more friendly spirit will grow up between the drivers and the freight house men. All of this will aid in correcting congestion.

The railroads might help in solving their own double problem; to get men to step more lively and not be so particular as to kind of freight they handle, and incidentally avoid congestion if they did not pay their freight handlers on a day or tonnage basis. What they ought to do is to pay their men so much per car. By so doing the men would step more lively and they would not be so particular as to whether it was heavy or light and bulky. Of course,

THE QUEEN CITY MOTOR DELIVERY Co., at 218-28 West Second Street, Cincinnati, Ohio, has had wonderful success in hauling by contract. Its motor fleet in the last eight months has increased from nine cars to twenty-seven. This increase in business has made it necessary to take a lease on a building, 90 x 40 ft. and three stories high, adjoining the present property. This addition will house the general offices, storerooms, Gould battery service department and a complete radiator department. The outlay in equipment will amount to about \$6000.



Sullivan Two-Ton Worm-Drive Truck

IN addition to their 1½ ton chain drive model, the Sullivan Motor Truck Corp., Rochester, N. Y., are manufacturing a two-ton worm driven model.

This truck has been designed after several years' close observation of what is necessary to construct a truck, which will meet the requirements of actual everyday service.

In the selection of units to build this truck, only those were selected which were built by manufacturers whose products had stood the test of time and had been tried out under varied conditions in all parts of the country.

The engine selected was the Buda four-cylinder, water-cooled, 4½ in. bore by 5½ in. stroke. Engine has three bearing crankshaft, 1¾ in. x 3½ in. front bearings, 2 in. x 2½ in. center bearing, and 2½ in. x 4 in. rear bearing. Connecting-rod bearings are 1⅛ in. x 2¾ in. and all bearings are made of nickel babbitt with bronze shell lining. This feature makes these bearings stand up under heavy and hard usage unusually well.

Valves are unusually large size and all valves and moving parts are enclosed and free from dust and dirt.

Connecting-rods, crankshaft and cam-shaft are drop-forged, and by special heat treatments their physical properties and strength are greatly increased. Each cap on connecting-rod is secured to the rod by four nickel steel heat treated bolts.

Oiling System

Oiling system is of the self-contained positive feed type, the oil being pumped from the oil reservoir, which is located beneath the crankcase, by a plunger pump, the oil being forced through the pipe. A sight feed glass is attached directly to the outlet of the oil pump to enable the operator to see that the pump is working properly. From the main bearings the oil overflows into four oil pockets in the bottom of the crankcase into which the connecting-rods dip. These pockets have overflow holes on each side which allows the oil to drain back into the reservoir beneath so that the oil remains at a constant level.

The oil pump and strainer are removable from the outside of the crankcase without disturbing other parts.

The crankshaft front and rear bearings and water pump or magneto shaft bearings are fitted with oil deflectors, permitting no oil to escape from the crankcase.

Timing gears are helically cut and are oiled by a constant stream of oil from the crankcase.

Accessibility to parts has always been one of the strong features of Sullivan trucks. By removing the lower half of crankcase, all bearings can be adjusted without disturbing the engine. Valves can be adjusted or ground very easily. Oil drain can be removed outside of engine. All wiring can be checked up right in front, and the carburetor and magneto are easily accessible.

By lifting up floor boards, clutch and transmission can be reached and if it should be necessary can be taken out very quickly.

Radiator

Engine is cooled with a Bush vertical tube radiator, which is placed on a rubber cushion and held in place with springs underneath. Fan of special design is mounted on two sets of ball bearings. Circulating pump is of bronze and of the centrifugal type with bronze runner and bronze bearings. Water pipes are extremely short and simple in construction and connect to the radiator without kinking hose. Water is discharged from pump directly beneath

the valves and cylinders are provided with large water jackets.

Bosch high tension ignition is employed, which makes not only a very reliable source of ignition, but also a very simple wiring arrangement. Engine is very easy to start.

The Holley carburetor is used, which has the very smallest number of adjustments possible and is connected to exhaust manifold with hot air heating stove, which has dash adjustment. This dash adjustment enables driver to make a large gas saving when driving.

Clutch and transmission are mounted in unit with engine, thus making it impossible for these parts to get out of alignment.

Clutch

Clutch is of multiple disc type made by the Brown-Lipe Co., made up of steel discs, a part of which are lined on both sides with Raybestos. Running dry it is not affected by heat or cold and operates equally as well in summer or winter. It is very easy in engagement and very powerful. It is enclosed and protected from dust and dirt at all times.

Transmission is Brown-Lipe, selective type, three speeds forward and reverse. All



Three-Quarter Front View of Sullivan Truck
Buda Engine, Timken-Detroit David Brown worm axle, and Brown-Lipe transmission are features of this truck

gears and shafts are made from heat treated chrome nickel steel, and are accurately cut, machined and ground to size. The transmission is mounted on Timken roller bearings throughout.

Control levers are in center on top of transmission, and gear shift lever has lock so that it is impossible to shift into reverse accidentally. Hand lever operates the emergency brakes and foot pedal for service brakes, and foot pedal for clutch. Throttle is operated by either hand lever on steering gear or by foot accelerator, each operating independent of the other. Ross steering gear is located on left hand side, and is of nut and screw type with very large bearing surfaces. Hand wheel is 18 in. in diameter. It is easy for driver to enter or leave truck from either side. Steering gear is strongly braced to dash so that it is held rigid at all times.

Power is transmitted from transmission to rear axle by means of two universal joints and propeller shaft. This propeller shaft is constructed of special formula tubing and has been specially designed so that its weight is minimum and stiffness maximum.

Rear Axle

Rear axle is Timken-Detroit David Brown worm axle. Axle shafts are full floating type, mounted on Timken taper roller bearings throughout.

Both sets of brakes are internal expanding type, 16 in. in diameter by 3 1/4 in. wide. They are so designed that full braking surface is in use. They are powerful and positive in action.

Frame is pressed steel of heavy section, 5 1/2 in. x 3 in. x 1/4 in., thoroughly braced with cross members and gusset plates and still is of flexible type. It is designed to give maximum strength with minimum weight. The front part of frame is inswept to give the shortest turning space possible.

Springs

Springs have been very carefully designed and are made of carbon silicon manganese, the highest grade steel made for this purpose. Springs have been made long and wide; they are semi-elliptic, and front springs are 2 1/2 in. wide by 40 in. long; rear springs are 3 in. wide by 52 in. long.

All spring bolts have oil cups provided, in fact, oil and grease cups have been liberally provided throughout the truck.

Gasoline tank holds 20 gals., is cylindrical in shape and is made of seamless pressed steel, with magnetic gasoline gauge.

Wheels are artillery type, constructed to S. A. E. specifications, with twelve 2 in. square spokes in front and twelve 2 1/4 in. square spokes in rear.

Tires are 36 in. x 4 in. front and 36 in. x 6 in. rear. Wheelbase is 150 in.

Equipment furnished includes seat and dash, with cushions. Dash is strongly braced; front fenders, which are solidly built and detachable, horn, tools, three oil burning lamps, and license tag brackets.

Price of chassis (only) is \$2250.

Brockway Trucks for 1917

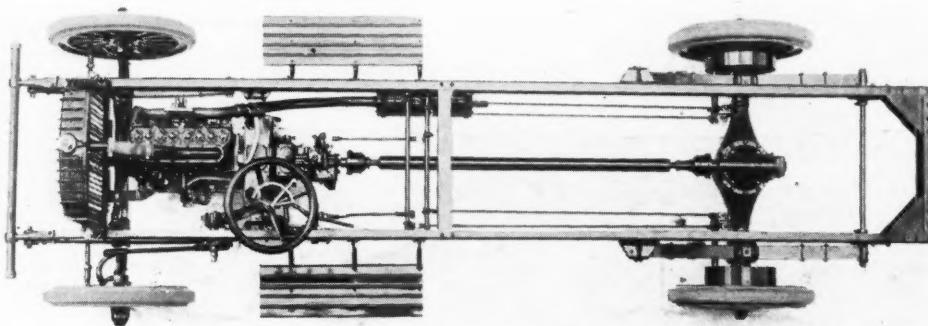


HE Brockway Motor Truck Co., Cortland, N. Y., has a line of models for 1917 comprising Model O, 1500-2000 lbs. capacity; Model J-2, 2500-3000 lbs. capacity, and Model K-2, 4000-5000 lbs. capacity.

The Model O was brought out this spring and the Models J-2 and K-2 have been changed over from unit power plant, which they had used for one and one-half years, to sub-frame transmission amidship, in order that the long propeller shaft might be constructed in two sections, preventing all whipping when used with long

The radiator is the Rome-Turney separate, seamless, finned tube core, covered by insurance policy guaranteeing it not to leak for the life of the truck on which it is installed. These tubes may be easily replaced by even an amateur. In connection with this core is used a cast upper and lower tank, the upper tank being flanged. The radiator hangs on coil springs to relieve it from all jar and shock. All models are equipped with 2 in. tubular bumpers. Steering post is strongly braced to dashboard.

The fenders are rigidly braced and running boards supported by three pressed



Top of Model O Chassis

Showing worm-drive rear axle, Continental engine, left-side drive, and bumper in front of car

wheelbase construction. In the Model O the unit power plant has been retained with dry disc clutch, using tubular propeller shaft with two universal joints, three-speed transmission and other specifications.

On the Model O is the three-point suspension, as are also the engines used in Models J-2 and K-2.

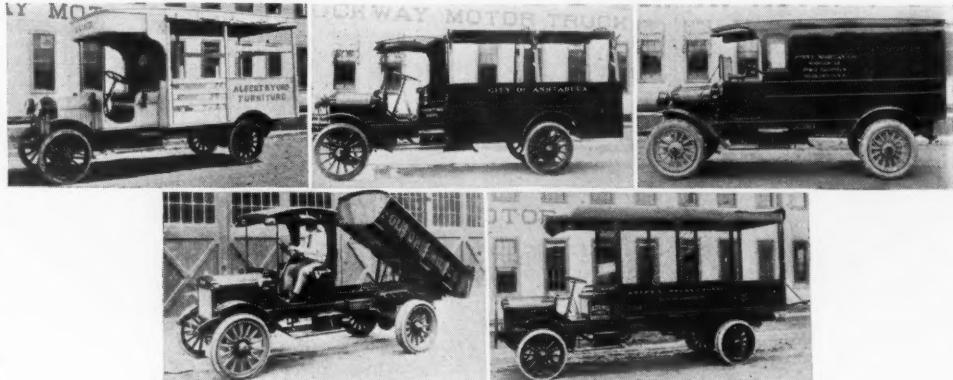
The Continental Model N Independent, 3 3/4 in. bore and 5 in. stroke, and the Continental Model C Independent, 4 1/8 in. bore and 5 1/4 in. stroke, engines are used. Bosch magneto with fixed spark is used exclusively, and also Schebler Model R carburetor with dash adjustment.

steel hangers, which make an exceedingly strong, yet light, construction.

On the Models O and J-2 Sheldon axles are employed, while on the Model K-2 Sheldon or Timken is optional.

Clutch and Transmission

The clutch on Model O is multiple dry disc, whereas on the Models J-2 and K-2 the clutch is a pressed steel, leather-face cone, with auxiliary springs underneath the leather to give easy engagement. A disc brake is provided on the clutch, so there is no wear on the roller, except when the clutch is actually held out. Owing to the design of the clutch pedal it will



Brockway Truck Models

Reading from left to right, top row first, these models are: Model O, special furniture body; Model J-2, special body for city lighting department; Model O, panel; Model K-2, power hoist for contractors; Model L, screen-side express.

be found to work exceedingly easy. The shaft between the clutch and sub-frame transmission is provided with two universal joints in grease and dust tight casings. From the transmission gear set final drive is by the double universal jointed propeller shaft to the worm gear rear axle. The worm gear is mounted with the differential as a unit, in Sheldon construction, it being semi-floating with ball bearing end thrust, whereas with the Timken construction it is full floating with roller bearing end thrust. The entire rear axle is of exceptionally rugged construction. The gear reduction is 8 2-3:1 on Models J-2 and K-2 and 6 1/2:1 on Model O.

Wheels and Springs

Wheels on Model O are 34 in., artillery type, S. A. E. standard with solid 3 1/2 in. front tires, and solid 4 in. rear tires, or 35 x 5 in. pneumatics optional. The Models J-2 and K-2 have 36 in. wheels, with 3 1/2 in. solid front tires and 5 in. solid rear

tires on Model J-2, and 4 in. solid front, and 6 in. solid single, or 3 1/2 in. dual rear tires on Model K-2.

The tread on Model O and J-2 is 58 in. all around, and on Model K-2 62 in.

Front semi-elliptic springs on Model O are 43 in. long, 2 1/4 in. wide with eight leaves, while rear semi-elliptic springs are 52 in. long, 3 in. wide, with nine leaves. Model J-2 has front semi-elliptic springs 44 in. long, 2 1/2 in. wide, with nine leaves; rear, semi-elliptic, 52 in. long, 3 in. wide, with twelve leaves. Model K-2 has front semi-elliptic springs 44 in. long, 2 1/2 in. wide, with nine leaves; rear, semi-elliptic, 52 in. long, 3 in. wide and thirteen leaves.

Frame and Wheelbase

Hotchkiss type of drive is employed on all models.

The frame is of heavy pressed steel channel, suitably cross-braced, all hot riveted, and with strong gussets insures plenty of strength.

Model O is made in 124 in. and 140 in. wheelbase, providing loading space of 8 ft. 6 in. long, or 10 ft. 6 in. long, respectively. Model J-2 is made in 124 in. and 140 in. wheelbase, with the same loading space. Model K-2 is made in 140 in. and 156 in. wheelbase, providing 10 ft. 6 in. and 12 ft. 6 in. loading space, respectively.

The chassis are all furnished painted with standard equipment.

Condensed Specifications

For the purpose of reference we give the following condensed specifications:

	Model O	Model J-2	Model K-2
Capacity.....	2000 lbs.	3000 lbs.	5000 lbs.
Chassis Price.....	\$1450	\$1825	\$2125
Engine.....	Contin'l	Contin'l	Contin'l
Bore.....	3 1/2 in.	3 3/4 in.	4 1/4 in.
Stroke.....	5 in.	5 in.	5 1/4 in.
Transmission.....	Selective	Selective	Selective
Clutch.....	Disc	Cone	Cone
Wheelbase in. 124 & 140	124 & 140	124 & 140	140 & 156
Rear Axle.....	Worm	Worm	Worm

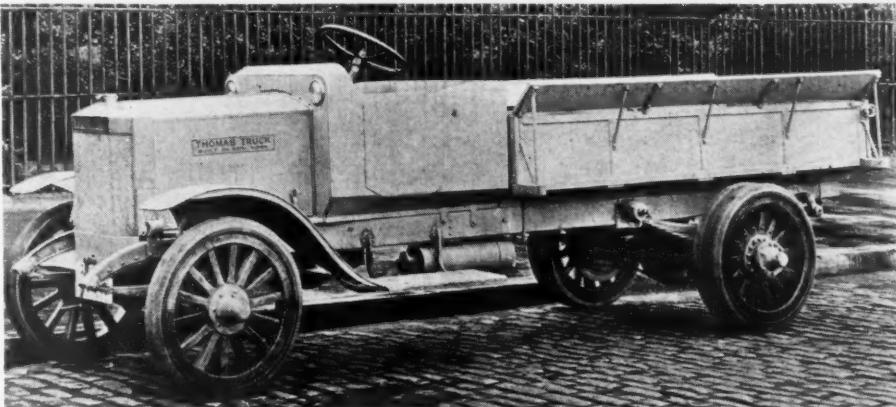
The Thomas Two-Ton Commercial Car

By C. P. SHATTUCK

WHEN it was announced that Charles K. Thomas, formerly vice-president and general manager of the Federal Motor Truck Co., of New York, had organized the Thomas Auto Truck Co., Inc., with a factory at 639 West 51st Street, New York City, and was to build a two-ton truck, the trade awaited with much interest an announcement of its details. In the selection of the components of the chassis and its equipment Mr. Thomas has applied the knowledge acquired as a manufacturer of trucks and parts and his wide experience as a sales executive, dealer and user obtained through personal contact with users of commercial cars in large cities where actual working conditions, cost of maintenance and service are important factors. Although the power plant, clutch, gear-set and rear axle are products of well-known manufacturers their proportions differ from stand-

ard practice in that provision has been made for those stresses obtaining under the most severe kind of service. Throughout the design is noticeable for the effort

made toward simplicity, and it includes several practical features that should reduce operating and maintenance costs to the minimum.

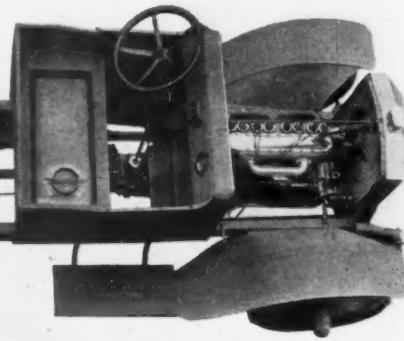


Thomas Two-Ton Truck

The driver's cab is fitted with fore doors, has a cowl dash, and both are of pressed steel

Unit Power Plant

The unit power plant includes a type OU Buda four-cylinder engine having a bore of 4 1/8 in. and a stroke of 5 1/2 in., and while rated at 27.20 h.p. by the S. A. E. formula, develops 33 h.p. at 1100 r.p.m. Ignition is by a Bosch NU4 fixed spark magneto and the carburetor is a Bergen. The fuel is supplied by gravity from a 22 gal. capacity tank located under the seat and a feature of the tank is that the filler opening is sufficiently large to permit one to easily insert the hand. Replenishing the fuel supply is expedited and the tank can be easily and quickly cleaned without removal. The filler cap can be easily and quickly removed or replaced by a pivotally mounted spring construction, the handles of which lock into slots.



Thomas Two-Ton Truck

Plan view of chassis showing large filler opening of fuel tank, pressed-steel running board and substantial fenders

Option of Radiators

Option is given of two types of radiators. That fitted for city work is a special Thomas cellular which provides greater cooling area than the conventional design, as its sides extend at approximately 45 deg. angles. This not only permits of compactly locating the fan and obtaining maximum cooling action from the sides and corners, but provides a greater distance for the cooling fluid to pass from the top to the bottom of the radiator. It is also claimed that the water will be more efficiently cooled when it reaches the inlet to the engine. The tubular type has staggered tubes, exposing them to the cooling action of the air, and both designs are mounted in a shell suspended on scroll springs to prevent shocks being communicated to the radiator proper. The filler cap is ample in size and is of non-detachable type. The cooling fluid is circulated by a pump. The hood is not provided with louvres, it being maintained that the design and capacity of the radiator makes for efficient cooling under all conditions of service. The engine is enclosed by webs or steel pans.

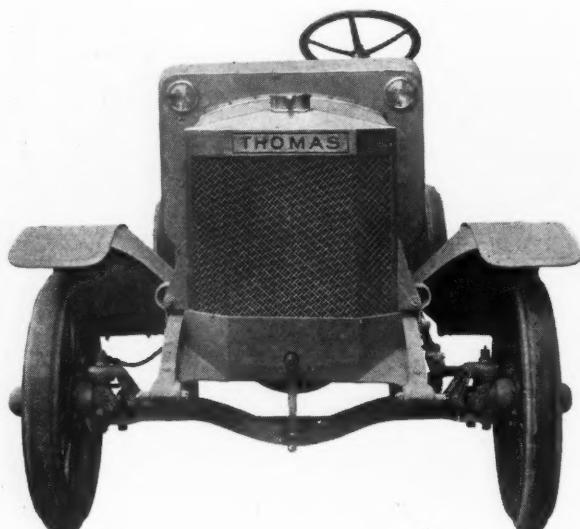
Standard Units

The clutch is a multiple disc, steel to fabric, and the gearset is a Covert Brown-Lipe type, affording the usual three forward speeds and a reverse. The gear ratios differ from standard practice, being particularly adapted to city work. Drive is through a $2\frac{3}{8}$ in. diameter hollow shaft with two universal joints to the latest type of Timken-David Brown overhead worm rear axle of exceptionally substantial proportions. The spring seats are integral, and anchored to these are 56×3 in. semi-elliptic silico-manganese steel springs having shackles bushed with phosphor bronze.

All bushings in the Thomas chassis are standard and replaceable. The bolts at the forward ends are protected by a bell housing, and are lubricated by accessible grease cups. The rear ends are shackled to a substantial rod extending across the frame. The front springs are semi-elliptic, $40 \times 2\frac{1}{2}$ in., and as with the rear members the main leaf curls around the eye.

Hotchkiss Drive

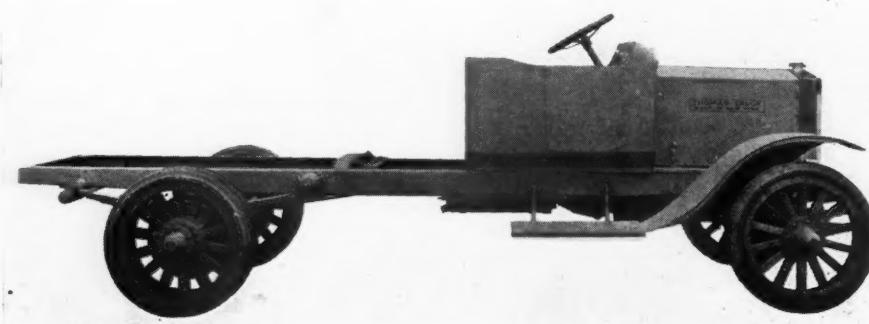
The drive and torque are taken through the rear springs, a Hotchkiss drive much



Thomas Two-Ton Truck

A head-on view, showing cellular radiator with sides extending at angle of forty-five degrees

employed abroad. The wheels are of hickory with square spokes, there being fourteen in both front and rear. The rear tires are dual 34×4 in., and the front 34×4 in. Option is given of 36×6 in. single rear. Two sets of enclosed brakes $16 \times 3 \frac{1}{3}$ in. lined with Raybestos act on the drums of the rear wheels, and the rods and levers are inside the frame and are readily accessible for adjustment. The frame is very sturdy and of a special alloy heat treated steel. It is $5\frac{5}{8} \times 3\frac{1}{2} \times \frac{1}{4}$ in., tapering to 2 in. at the rear. The standard length is 214 in., and the four cross-members are sturdy and are hot riveted.



Side View of Thomas Two-Ton Truck Chassis
Showing semi-elliptic heavy-type springs with main leaf a scroll around the eyes

The CCJ leads in circulation, advertising and prestige

Pressed-Steel Cab

The front axle is the latest type Timken, an I-beam section, and the steering knuckles have adjustable roller bearings making for ease in steering. Adjustable Timken bearings are utilized throughout the chassis. The steering gear is a Ross with a 20 in. wheel and the column is well anchored. The column is free from the usual gas and spark controls for, as previously mentioned, ignition is by a fixed spark magneto. An accelerator pedal is mounted between the clutch and service brake pedal. The driver is located at the left with the cane handle rocking type gearshift lever and emergency brake lever at the right on the transmission housing. The governor is a duplex.

The driver's cab is a foredoor construction of pressed steel as is the cowl dash. The instrument board is set at an angle and carries only the combined Bosch lighting and ignition switch. Pressed steel is utilized for the floorboards and running boards, and the former are so installed as to avoid the possibility of rattling and vibration. An example of the sturdiness of the Thomas construction are the fenders. These are made of unusually heavy sheet steel and are so reinforced that they will safely support the weight of one person without yielding.

Electric Lighting

The standard equipment includes electric lighting, a Bosch DSG6 12-volt generator driven by an enclosed silent chain maintaining a 110 ampere-hour capacity battery in a properly charged condition. The battery is located in a sturdy container mounted on the running board as is the tool box, but both are so situated that the driver cannot use either as a step. The side lamps are mounted flush with the dash. The equipment is complete and includes bumper, hub odometer, tools, jack, etc. Choice is given of tires, and if desired the wheel will be supplied in varnished natural wood.

The Thomas Auto Truck Co., Inc., is prepared to supply special as well as standard types of bodies and will furnish chassis lengths to meet individual requirements. Its selling policy will include a special maintenance and operation proposition, of which service is to be the keynote. Plans have been perfected whereby users of the Thomas trucks will be assured of prompt service as well as replacements.

KOEHLER ONE TON TRUCK, CHASSIS \$895

For the coming season the H. J. Koehler S. G. Co., Newark, N. J., is announcing the 1917 Koehler, which is larger and more complete than the 1916 model, although listed at \$895 for the chassis complete, which is \$45 less than the 1916 price.

Burford Two and Four-Ton Trucks



THE Burford Motor Truck Co., with offices at 351-59 Spitzer Bldg., Toledo, Ohio, and plant at Fremont, Ohio, is building a line of commercial cars consisting of two models, the "O2" two-ton vehicle and the "D3" four-ton car.

Burford Two-Tonner

The engine of this model is a Buda, four cylinders, $3\frac{3}{4} \times 5\frac{1}{2}$ in. bore and stroke. It is three-point suspended and forms a unit power plant with the clutch and transmission. The carburetor is a Zenith L5 with hot air attachment fitted to the exhaust. An Eisemann high tension magneto with fixed spark furnishes the ignition and cooling is effected through an improved gilled tube radiator of large capacity, which is mounted on a flexible support. The gasoline capacity is 13 gals., the tank being in the dash with gravity feed to carburetor. The tank is of seamless steel.

Clutch, Transmission and Drive

The clutch is a leather faced cone member with springs under the leather to secure easy and smooth engagement. The transmission is of Warner make and, as before stated, is in unit with the engine. It provides three forward speeds and one reverse. The drive is by standard propeller shaft, which is supported midway by an annular bearing, which in turn is held by a cross frame member.

Axes, Brakes and Springs

The front axle is drop-forged from high carbon steel, of I-beam section, $1\frac{3}{4} \times 2\frac{1}{8}$ in. It has roller bearings, 58 in. tread and road clearance of 11 in.

The rear axle is of internal gear type with a ratio of 8.5:1. Double bearings, Non-Gran bronze and double thrust roller bearings. Road clearance is $11\frac{1}{4}$ in. and the load carrying portion of the axle is of I-beam section, $2\frac{1}{8} \times 3$ in. The spindle is $2\frac{5}{8}$ in. in diameter, track 62 in. and torque taken by springs.

The service brakes are of internal expanding type on the rear wheels, the emergency set being external contracting on the drive pinion shaft at the axle end.

Springs are of Perfection make, semi-elliptic in form, with bushed eyes. Spring clips are of heat-treated nickel steel.

Wheels and Steering

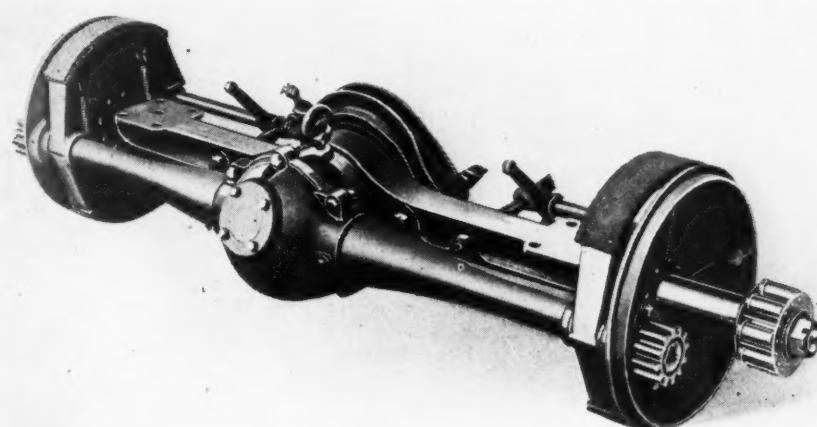
Wheels are of Schwarz make, constructed of second growth hickory, there being twelve 2 in. spokes on the front wheels and the same number of $2\frac{1}{2}$ in. spokes on the rear wheels. Tires are Firestone $36 \times 3\frac{1}{2}$ in. all around, the front

set being of single type and the rear set being dual.



Burford Model O-2

Three-quarter view of the Burford two-ton truck, showing radiator with detachable top and bottom



Burford Rear Axle

Internal-gear drive type, used on Model O, two-ton truck



Four-Ton Burford Truck, Chassis \$3600

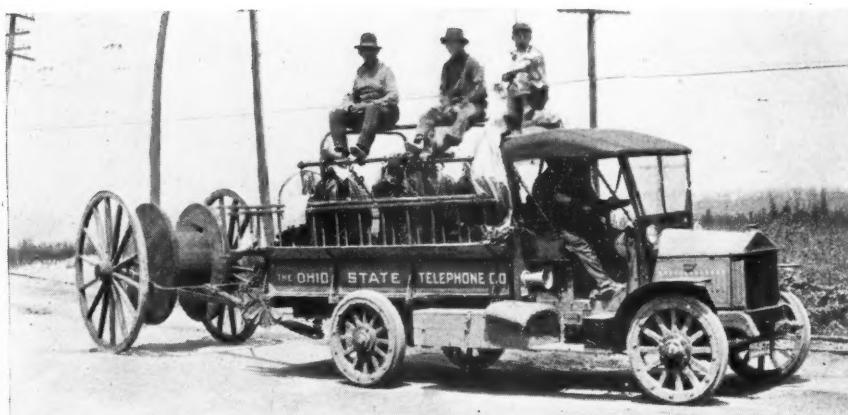
Has Waukesha engine, Brown-Lipe transmission, Sheldon-David Brown worm drive, Zenith carburetor and Perfection springs

The steering gear is Ross make, located on the right side of the car, and is of nut and screw type. The rim of the wheel is 18 in. in diameter. Gear shift control is in the center of the car, and the control lever, which is located on the wheel or the foot accelerator can be used to control the speed of the car.

The standard wheelbase is 144 in., total length of frame $225\frac{3}{4}$ in., of which $138\frac{1}{2}$ in. is behind the driver's seat. The short wheelbase is 132 in.

Other Details

The empty chassis, without driver's seat or body, weighs 3900 lbs. Equipment includes two 4 c.p. electric side lamps, one 4 c.p. electric tail lamp, 6-volt, 80-ampere hour Willard storage battery, jack and



Model O, Burford Two-Ton Truck

In service of the Ohio State Telephone Company. This truck is used both day and night

tool kit. Finish is in priming coat of lead and speed is 14 m.p.h. The price is \$2250 for the chassis.

Burford Model D3—Four-Tonner

On this model the engine used is a Waukesha four-cylinder, $4\frac{1}{2}$ in. x $6\frac{3}{4}$ in. bore and stroke, the cylinders being cast in pairs. The power plant is four-point suspended. The gasoline capacity is 23 gal., the tank being located under the driver's seat, feed to the carburetor being by means of a Stewart vacuum system.

Transmission and Drive

The transmission is an independent unit of Brown-Lipe manufacture, there being four forward speeds and one reverse. The drive is by standard propeller shaft from the clutch to the transmission and thence by a second propeller shaft to the worm in the rear axle.

Rear Axle

The rear axle is of Sheldon-David Brown type worm and wheel, the gear ratio being 8.7:1. Double rows of ball bearings take up the load and thrust. Road clearance is $9\frac{3}{4}$ in., axle is semi-floating

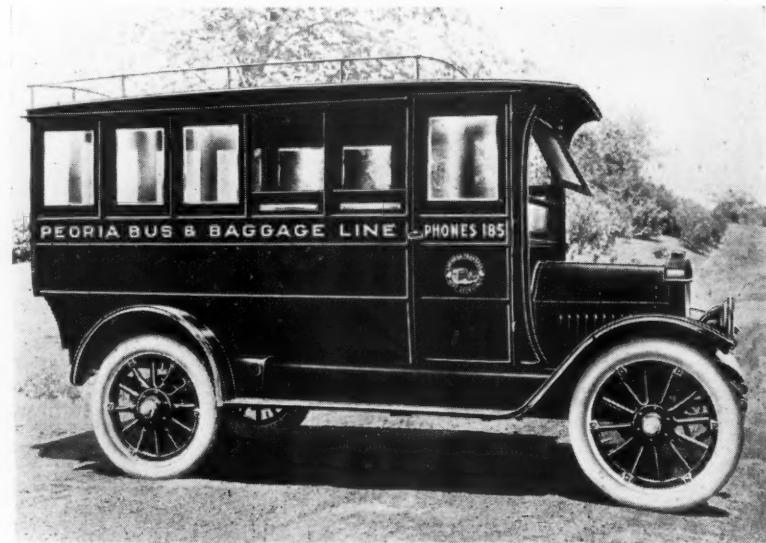
type and tread is 56 in. Two radius rods take the driving thrust, the torque being taken by the rear springs.

Other Details

The wheels on this model have fourteen spokes all around, the front ones being $2\frac{1}{2}$ in., rears 3 in.; tires are United States 38 x 5 in. single in front and dual in rear.

Wheelbase is 175 in., total length of frame 252 in.; weight of empty chassis, without seat or body, 7350 lbs.; speed 11.5 m.p.h.

The price for this model is \$3600 for the chassis. The other specifications for this model, with the exception, of course, that dimensions are larger, are the same as for the Model O2.



New 'Bus Body on Commerce Chassis

The Commerce Motor Car Company, Detroit, Mich., announces that it will continue its present line for the coming season. A new 'bus body, shown in the above illustration, has been added to the body line



FWD as a Locomotive

This Four Wheel Drive Truck, made by the Four Wheel Drive Auto Company, Clintonville, Wis., in the service of the Hanlon & Oakes Company, contractors, of Sioux City, Iowa, is used in place of a locomotive to draw a string of heavily loaded trailers on a narrow-gauge track. The truck itself straddles the rails, and it is interesting to note that enough traction is secured to pull the train easily up a five per cent grade, although no load whatever is carried on the body of the truck. The crushed rock, gravel and cement hauled by this outfit are being used in the construction of a 16 foot concrete highway going north from Sioux City on what is known as the Perry Creek Road. The large amount of material hauled is indicated by the fact that from 500 to 600 linear feet of pavement are being laid daily. The track is four miles in length and ten round trips are made each day. Each trailer carries $1\frac{1}{2}$ yards of gravel or crushed rock, making a total pay-load of 24 to 26 tons. The truck pulls this load while running in high gear, and travels at 12 to 15 miles per hour.

Corbitt Announces Four Models



THE Corbitt Automobile Co., Henderson, N. C., announces for the coming season a line of trucks as follows: Model A is a 3 to 3½-ton; Model B, 2½-ton; Model C, 2-ton, and Model D, 1½-ton. All these trucks are worm driven.

Model A Corbitt

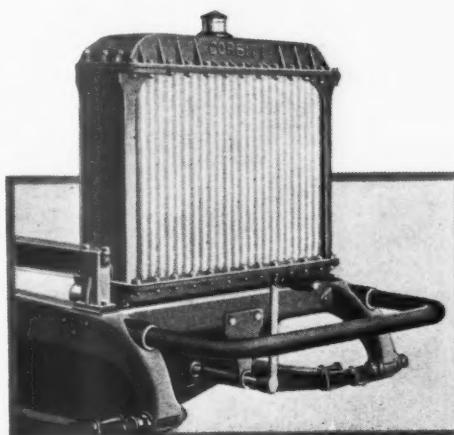
On this model the engine is a Continental, four-cylinder, 4½ in., bore by 5½ in. stroke. Clutch is Hele-Shaw multiple disc, running in oil, while the transmission is a Cotta independent selective sliding type, allowing three speeds forward and reverse. Ignition is by Eisemann high tension magneto, cooling is by water, making use of a centrifugal pump and cast iron radiator with helical tubes mounted on eccentric, radiator being suspended on springs. The carburetor is a Stromberg float feed type.

Axles, Brakes and Springs

The front axle is an I-beam section member, forged from nickel steel with spring seats made integral. The spindles are case hardened and mounted on annular bearings. The pins and bushings are case hardened and ground to a glass finish. Steering rods are 1¼ in., mounted throughout on annular bearings.

The rear axle is an imported worm and worm wheel, the worm being of special steel, which is heat treated and ground. The worm wheel has a face of 2½ in. and all thrust is taken up by extra double thrust bearings, the mount throughout the axle being on annular bearings. The worm carrier is in a very substantial casting, the machine work being done by means of special jigs, thus making adjustment unnecessary. The worm, worm wheel and differential are assembled in one carrier and can be removed from the housing as

a single unit. Differential gears and pinions are of 3½ per cent. nickel steel with 1½ in. face, 4 in. pitch. The axle housing is a one-piece casting of high grade steel, the floating axle shafts being of chrome nickel steel.



Corbitt Radiator

This is of cast iron with helical tubes mounted on eccentric and suspended on springs. Radiator surface, 16,226 sq. in.

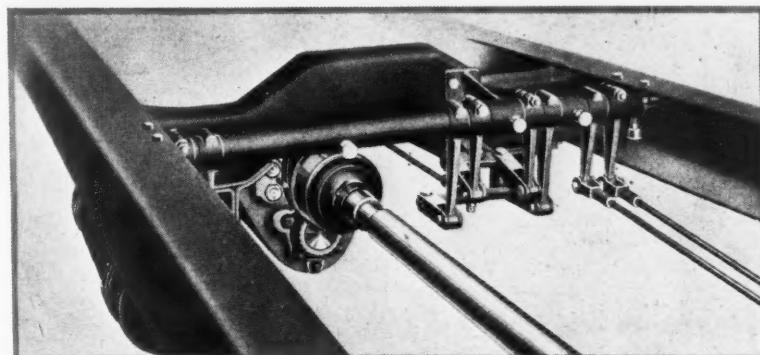
The brakes are 20 in. in diameter by 2½ in. wide. All four brakes are of the internal toggle wrap-up type and are all enclosed, protecting them from dirt and grit and prolonging the life of the lining. The brake levers are extended inside the frame, giving a direct pull on the brake rods.

Springs are semi-elliptic, the front set being 3 in. wide by 40 in. long, the rear being 4 in. wide by 54 in. long. The material used is chrome vanadium steel, the eyes being bushed and bronzed and all leaves slotted to prevent side slip. A rubber bumper is provided on the front spring.

Other Details

Drive is by Hotchkiss, through Hartford propeller shafts with two universal joints. Wheelbase is 168 in., tires 36 x 5 in. front, 36 x 5 in. dual rear, either Goodrich or Goodyear, frame of channel steel, bumper on front, 20 gal. gasoline capacity, tank being located under front seat with gravity feed; speed 8 m.p.h., controlled by Pierce speed controller; ratio, 11.7:1.

Bodies are made to order, prices being \$100 average for the body alone, \$30 for



Corbitt Tumbler Shaft

This shows the tumbler shaft, equalizer and universal connected to the rear transmission

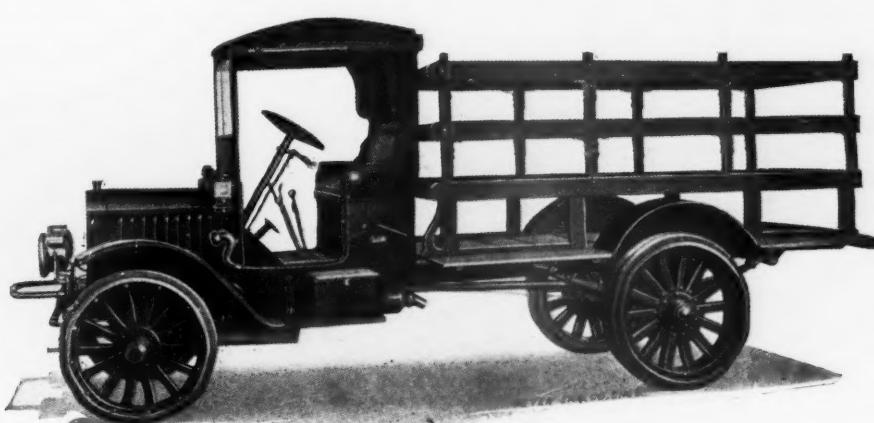
cab, \$25 for lights, \$20 for painting, and \$5 for striping. Equipment consists of two head lamps, together with Prest-O-Lite tank, two side oil lamps, one rear oil lamp, Hubodometer and Klaxon horn. There is also a complete kit of tools, jack, port wrench and hub wrench.

The price of this model for chassis only is \$2900.

Corbitt Model B

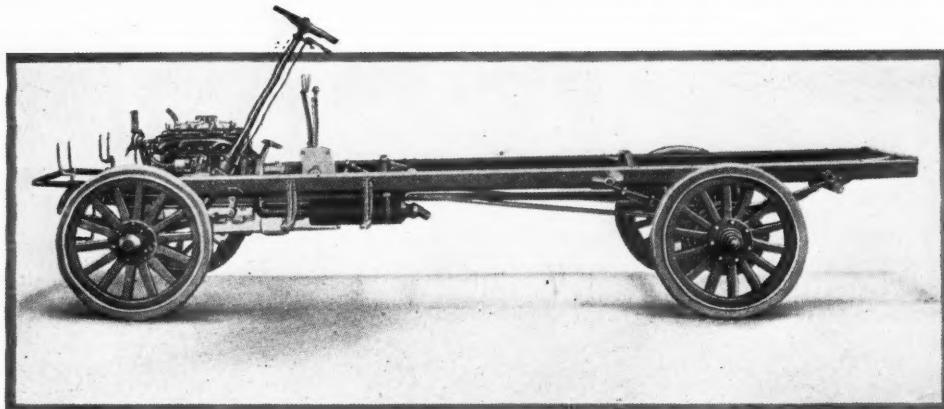
This model has a capacity of 2½ tons, bore of engine being 4½ in., stroke 5¼ in. Clutch is Brown-Lipe dry plate type, faced with Raybestos. Transmission is Brown-Lipe, being incorporated in one unit with the engine and clutch, allowing three speeds forward and one reverse.

Wheelbase is 148 in., tires 36 x 4 in. front, 36 x 4 in. dual rear, with the option of 36 x 7 in. single rear, speed 13 m.p.h., chassis price \$2650. Other details, with the



Model A, Corbitt Worm-Drive Truck, \$2900

This has Continental four-cylinder engine, multiple-disc clutch, three-speed Cotta transmission, Eisemann magneto, worm-drive rear axle and wheelbase of 168 in.



Side View of Corbitt Chassis

This view shows low-hung engine, semi-elliptic rear springs, well-braced frame, and other details

exceptions of dimensions, are the same as for the Model A.

Model C Corbitt

The capacity of this model is 2 tons; wheelbase, 148 in.; tires, 36 x 4 in. front, 36 x 3 1/2 in. dual rear; other details being much the same as Model B.

Model D Corbitt Truck

This model has a capacity of 1 1/2 tons, engine bore 3 3/4 in.; stroke, 5 1/4 in.; tires, 36 x 3 1/2 in. front, 36 x 4 in. rear; chassis price, \$2150. Other details are same as Model C.

[MENOMINEE MODELS CHANGED

The Menominee Motor Truck Co., Menominee, Mich., has made several changes in its models for the coming season. The Model EW, 1500 lb. truck, chassis price \$1295, is a continuation of the former Model E with some minor changes. The engine, a Continental, is the same size, having a bore of 3 3/4 in. and stroke of 5 in., developing 25 h.p.

The Model H has a capacity of 1 1/2 tons and the chassis, fully equipped and furnished in priming coat, lists at \$1775. This model follows in design the lines of the former models FW and D. The engine, also a Continental, has a bore and stroke of 3 3/4 x 5 1/4 in.; tires are 36 x 3 1/2 in. front and 36 x 5 in. rear. Wheelbase is

either 130 or 144 in. at the option of the purchaser.

For complete details and illustrations of Menominee trucks, consult our March, 1916, issue, page 245, in which we fully described the Menominee line.

DART MAKES IMPROVEMENTS

The Dart Motor Truck Co., Waterloo, Ia., announces that for the coming season, the models of last year will be continued, but a Buda 3 3/4 x 5 1/8 in. engine is being substituted for the 3 1/2 x 5 1/8 in. engine. All the worm driven models are now being equipped with Stewart vacuum feed. The full line consists of:

Model.	Capacity.	Chassis Price.
D	750 lbs.	\$650
A	1000 lbs.	850
BB	1500 lbs.	1300
E	1 1/2 tons	1600
CC	2 1/2 tons	2100
B	1 ton	1400
C	2 ton	1800

Chase Motor Truck Co., Syracuse, N. Y., will shortly bring out a Model X 3-ton worm-drive truck to list at \$2,800. The new model will round out a line of trucks of 3/4, 1, 1 1/2, 3 and 3 1/2 ton capacities.



Armored Car on King Chassis

New American-made armored car on eight-cylinder King pleasure car chassis. A company has been formed in this country to manufacture bodies for this type of military car. They will purchase the chassis from the King Motor Car Company, Detroit, Mich. While the illustration shows wire wheels, the car will be regularly equipped with disc wheels and airless tires. The car carries a gun in a revolving turret, tools and skids for fording purposes. This type of car has proven highly efficient in the European War.



Wichita Trucks Haul Lumber

These trucks made by the Wichita Falls Motor Company, Wichita Falls, Texas, are in the service of the Peterson Lumber Company, San Francisco, Cal.

Riker Trucks Do Work Impossible With Horses

Records Made Hauling Heavy Logs in Washington Forest



UT in the yellow fir forests of the State of Washington, Riker trucks are making history in the hauling of big unusually heavy logs. In the logging country of King county, right around Woodinville and Redmond, there is something like 250 million ft. of lumber ready for cutting. In this section the Machias Mill Co. is working near Woodinville, which is approximately 15 miles from Seattle, is located on the Machias River and also on the Northern Pacific railroad. This is a comparatively small mill cutting anywhere from 80 to 100 thousand ft. of lumber a day, practically all of this being yellow fir. In size the logs measure anywhere from 16 in. to 6 ft. in diameter at the butt, while the top runs anywhere from 14 in. to 5 ft. These sizes of logs are being cut in 20, 22, 26, 30, 40 and 42 ft. length.

To haul these enormous logs on the Riker truck owned by this company, a trailer was built to the company's order by a Seattle firm, this consisting of a heavy metal frame work mounted on a pair of regular Riker truck wheels and having the regular rubber tires and the same bearings as the rear wheels of the truck. The trailer is connected to the truck by means of a round reach rod, which has a spring connection at the front and a variable connection at the rear.

On top of both the truck and the trailer are what is called a bunk. This is a kind of heavy wooden support for the log and is arranged with a clip at either side so that the logs are held from rolling off. When it is desired to dump the logs, these clips can be released.

By means of the reach the length is adjusted so that approximately one-third is carried on the truck and two-thirds on the trailer. In this way it is possible to carry loads up to 12 tons total weight, although the truck chassis is rated at but 4 tons.

The average load runs about 2600 ft. board measure, although one carries almost 3000 ft. board measure. These figures, of course, are taken from the size of the small end of the log and represent the number of board ft. which can be cut from the log, not the actual number of board ft. in it. Neither is the bark nor the larger end figured in.

With this truck the timber is hauled from the woods over a made road the first part of the way, and then along a dirt road, and again onto a made road at Lake Sammamish. Here it is dumped into the water and hauled by tugboat through the lake into the Machias River and to the Machias mill. After cutting, the lumber is shipped to all points in the Northwest by railroad.

The distance is $7\frac{1}{2}$ miles, making the round trip 15 miles. On the average the truck makes six round trips with 2500 ft. as the load. However, they have gotten out 15,680 ft. in one day. It is not practical to use teams on such a long haul, and with such heavy loads, so that the Machias

Co. is now getting out the timber which is not accessible by either rail or water, and which could not be logged profitably



Unloading the Logs into Lake Sammamish

The truck is driven alongside of platform and logs rolled off with the peavy

without the use of the truck, or, in fact, in any other way.

Despite the poor surface over which the truck is running continuously, including roads made from heavy boards with sharp edges and the poorest kind of dirt roads, also the tremendous loads which are being carried, the truck has shown up very well. At a little over 3000 miles the front tires had not yet begun to show wear; the rear tires looked as though they would just about go the guaranteed distance, while the tires on the trailer looked as though they might go 8000 miles or a little better. This is rather unusual considering that the trailer loads have been more than double the truck load. The driver estimates the gasoline at approximately 4 miles per gal., unusually high for the work done. The Machias truck is doing about 200 miles to the gal. of lubricating oil, although this also is a driver's estimate, no particularly accurate record being kept of these items.

Another truck which is doing excellent service for loggers is that operated by Smith & Olson. This company is now cutting timber (also yellow fir) in the neighborhood of Redmond, King county, Washington. After cutting the logs are hauled



The Old Method

Hauling logs with horses on a three-quarter mile haul, making five trips of 1000 ft. per load per day or 5000 ft. per day. The Riker truck has hauled 42,000 ft. in a day.



Hauling Logs From Train to Sawmill

The Smith & Olson truck at railroad siding. The average load is two thousand feet board measure and as many as twentyone trips have been made in a day



Riker Truck Carrying Three Thousand Feet of Logs

This load is hauled over a made road the first part of the way and then along a dirt road and again onto a made road at Lake Sammamish

by Riker trucks to railroad siding, where they are loaded on logging cars and shipped to another company, which operates a sawmill. This truck operates under a very unusual condition also, the length of haul being only 1.1 mile or 2.2 miles to the round trip. This includes one very long and very steep hill, which always gave trouble with horses.

Formerly this company employed a number of four-horse teams, these making approximately five trips a day when conditions were favorable, and hauling not more than 2000 board ft. per load. In this same work the truck averages twenty trips a day and has done twenty-one and twenty-two, hauling an average of 40,000 board ft. and has hauled over 42,000. In this work it is replacing four of the four-horse teams and requires only one driver, therefore replacing three teamsters. The trailer used in this instance is the back portion of an

old Mack truck which was sawed in two in the middle, the driving sprockets and chains removed, the springs reinforced, steel tires put on the wheels in place of rubber, and a bunk put on top of the framework for the logs to ride upon.

The average log hauled is about 30 ft. long and measures 4 ft. in diameter at the butt and about 35 in. at the top, although these logs vary all the way from 3 ft. to 6 ft. in their largest diameter. The average load is about 2200 ft.

The driver on this Smith & Olson truck also estimated his gasoline at 4 miles per gal. and claimed to be doing 400 miles to the gal. of lubricating oil. No figures are available as to the tires in this instance.

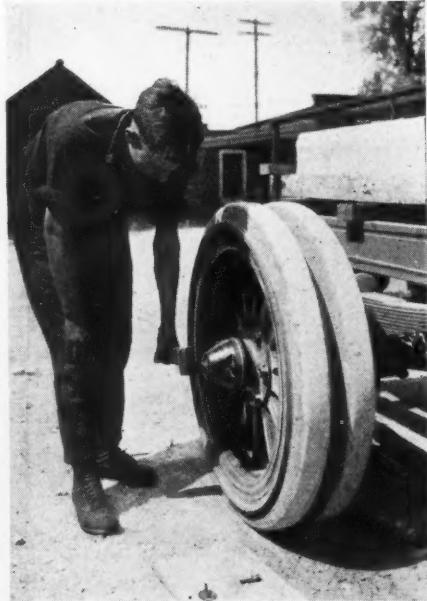
In addition to these two instances described in detail a number of other Riker trucks are at work in logging service, the

sterling nature of the truck being such that it stands up unusually well under this hard rough work, and is showing the logging men some things they never dreamed of in the way of a big day's hauling, as well as proving that motor trucks will move logs faster, farther, easier and cheaper, with less extra equipment, than any other power.



Auto Engine Heats Water for Bill Poster

A novel use for the auto engine was found by a New York bill-posting firm which makes use of the Autocar for its crews. In winter it was always a problem to keep sufficient hot water on hand for the paste, and this difficulty was solved by connecting the water tank with the radiator supply. The heated water from the radiator circulated through the water tank and kept the water at the right temperature for mixing the paste. The illustration shows the knights of the brush at work, and a bill poster drawing water from the machine for use in mixing with the other ingredients.



New Wilson Wheel Puller

Among the new features of design incorporated in the latest model chainless-drive motor trucks produced by the J. C. Wilson Company, of Detroit, is a novel form of wheel puller, by means of which the rear wheels may be readily removed by the driver or mechanic without resort to complicated attachments or tools other than an ordinary wrench. The operation here illustrated consists simply in first removing the three bolts holding the hub cap to hub flange, unscrewing the simple disc dust plate in the end of the cap, removing the large nut holding the rear wheel to axle spindle, and again attaching the hub cap by means of the three bolts. Any regular one-inch, nine-thread bolt is then inserted in the end of the hub cap and screwed against the end of the axle till the wheel slips off.

Milwaukee Firemen Go to School

By H. L. CONNELL

TOO few private owners of trucks learn early enough the real value of a well-trained driver, but the Milwaukee Fire Department has taken steps which might well be copied by both individuals and other municipalities. This was in sending the drivers to school. By an arrangement with the Central Continuation School—also a city institution—two groups, of 20 firemen each, attended classes twice a week for 52 weeks. The work, which was given by the writer, who has charge of the automobile division of the school, covered the principles of construction, care and operation of the various motor car units.

That the men themselves appreciated the opportunity of receiving this instruction can be realized, when the usual fire department routine is considered. Driving a team of three plunging fire horses or operating a steam pumping engine are matters which take long training and considerable skill, but all this experience is of little help to the men when they are called up to handle gasoline driven apparatus. Usually the training on the new job is very short and consists of about two weeks' coaching by a mechanic from the maker's factory. Even after that the practice which the men get is very little, for, with the exception of the chiefs' cars and squad wagons, very few pieces cover more than 500 miles a year. Although the men have plenty of spare time they can do little real studying of the construction of their machines since, for the most part, the makers do not issue detailed instruction books as do the pleasure car and commercial truck makers. This is because the specifications vary to a greater or less extent for the machines furnished different cities.

been ordered. When attending the classes they were as much on duty as if at the fire houses and in case a second alarm fire had occurred while at the school they would have been called upon to respond.

Subjects Taken Up

Principles of construction and operation, the forestalling and overcoming of minor troubles and practical repair work were the points emphasized in the classes. In the lectures, which took up the first hour of the three-hour periods, the projection lantern proved very helpful, for with it opaque pictures could be thrown upon the screen. In this way fire department applications were shown by clippings from catalogs, since the text-book covered mostly pleasure car practice. Not only were the principles of construction and operation covered, but much time was devoted to the avoiding of those minor troubles which might delay a truck in responding to an alarm. Although most of the drivers had had experience with water in the gasoline it was a surprise to them all to learn that water collected in the oil reservoir due to the condensation of the products of combustion and that this could cause trouble by freezing while standing at a long winter fire. The men were also

encouraged to tell their past troubles for the benefit of the others.

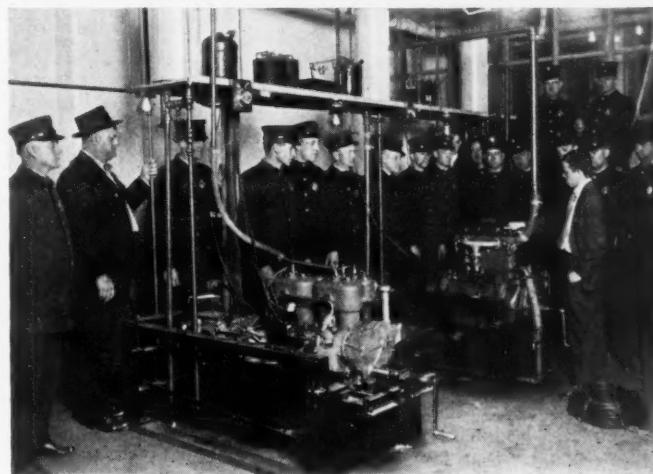
It might be noted in passing that the one-hour classroom period is just about the right length of time, both from the standpoint of the student and the instructor. In the evening classes given by the writer the lectures are supposed to last for two hours. Although this might not

be too long for the trained college student, it is certainly so for grown men who have left their school days a long way behind. By following the class period by a couple of hours in the laboratory very satisfactory results were obtained.

Complete Laboratories

Two large laboratories are provided for the automobile division, one of these be-

ing for the light equipment and the other for the heavy, by which is meant the engines and chassis. Exhibit tables line the walls of the light equipment room and on these are placed the different types of motor car units from radiator sections to rear axles. Here are also sections of the leading makes of carburetors and a point worth noting is that these sturdy models are duplicated in the motor room so that the students may actually adjust the same carburetors of which they have



Class of Milwaukee Firemen

These attended school all winter and spring

examined the internal construction. In the study of such units as the carburetor and magneto the use of question sheets has proven very successful, for in order to write out the answers to the questions it is necessary to give the unit really careful observation.

In the motor room the engines are mounted on cast iron test stands and are coupled to water dynamometers. There is a six-cylinder T-head engine and three four-cylinder engines, two of them of the L-head construction and one with the I-head. The school also owns two complete chassis and these may be run in the laboratory by placing the rear wheels over two large drums sunk in a pit. With all this equipment in daily use by the other classes it is not surprising that the firemen had plenty of opportunity to make adjustments and do overhauling. To make the repair work still more varied and practical several outside cars were taken in and completely overhauled with no charge for the work.

Altogether ten major repair jobs were completed by the firemen. This part of the work will probably be of especial benefit to the fire department, for it is the custom to send the driver along with the machine when it has to go to the repair shop, but this may not happen more than once a year. Thus it may be seen that the experience gained in the use of tools alone in five or six hours' shop work a week



Light Equipment Laboratory

Automobile division of Central Continuation School at Milwaukee, where firemen are studying the automobile

After a trip through the well-equipped automobile laboratories Chief Thomas Clancy realized that the school was in a position to help solve many of the problems cited above and he, therefore, turned forty of his men into schoolboys again. These men were the drivers and engineers on the automobile apparatus, together with a few others who will probably be chosen to handle the new machines which have

during the term was equal to several years of regular fire department routine. From the class work it is hoped that the men have gained enough insight into the workings of their machines so that the occurrence of minor troubles will be greatly decreased and that when trouble does occur it will be quickly overcome. Another gain from the work should be the ability of the men to give much clearer explanations of their troubles to the master mechanic.

Classes for Others

A word might also be said as to the other classes in the automobile division and the nature of the school. The laws of Wisconsin require that all boys and girls between the ages of 14 and 16 years, who have stopped attending the regular schools and who are working, shall obtain a working permit and shall attend a continuation school a half day a week. Last year the law was amended to require attendance up to 17 years of age. All apprentices under written contracts must also attend the school a half day a week. The State gives a certain amount of financial aid to the cities for these schools.

Besides this compulsory day attendance evening classes are provided in any subject for which there is a demand. These classes are open to anyone in the city over 16 years of age. A dollar deposit is required and if the student has attended 75 per cent. of the time the dollar is refunded upon his withdrawal or at the end of the term. Thus, the night school is really free. Last winter over 300 took the evening work in the automobile division which, by the way, is the largest department in the school. In the day time there were also classes for about 100 of the boys from 16 to 17 years of age, beside the firemen classes which have been described above.

SOME WAYS IN WHICH TRUCKS ASSIST FARMERS

By GEORGE W. GRUPP

Of what good is a truck to a farmer? This question a large number of farmers are asking themselves. A good many of the Western New York farmers have already answered the question by buying a

motor truck and harnessing it to do a great many tasks, tasks which help to make the truck a valuable asset and a real dividend producer.

General Hauling on the Farm

The task of merely hauling produce from the farm to the city is not the only thing these farmers make their trucks perform. On the contrary, they use their trucks as a means of hauling trees, shrubbery and plants between the nursery and the farm; to haul top soil, lime, cement, fertilizer and gardening implements to and about the farm. They use their trucks to collect brush and occasionally they convert them into sprinkling tank wagons, etc. The truck has also been found to be very useful in the transporting of live stock to the stock farm or exhibition grounds; to go on emergency errands for the kitchen, wine cellar, refrigerator, stable, granary and garage; or to carry passengers and baggage between the farmhouse and the railroad station. Also, it is being used to make weekly trips to the city to bring back household staples and supplies, fixtures for either the house or the stable, dairy, poultry yard and kennel.

Other things to which these farmers might put their truck to good use would be to harness their engines to saw wood, chop feed, shell corn, pump water, operate a lighting plant or a cream separator.



W. Agle, of Eden, N. Y.

Mr. Agle comes to Buffalo each morning with a load of produce. He has a regular stand on the market. With this truck, he hauls lime, cement, fertilizer and a great many other things.



J. B. Gates Uses Truck to Haul Vegetables to the Market Every Other Morning

The box is of such construction that he is able to carry passengers to and from the station to his farm

The CCJ has most readers because it gives most information

Makes Available Unused Land

With the aid of a motor truck the farmer is able to reach heretofore impossible markets. Thus the truck has increased his income and profits. It has also widened his territory and made it possible that untilled soil can now be utilized, which heretofore was abandoned because of its distance from a railroad station.

Then again, a farmer with a motor truck is able to deliver his perishable goods to the markets nice and fresh. He can, under such conditions, afford to undersell his competitors who use horses. Also, he is able to get back to his farm very much more quickly.

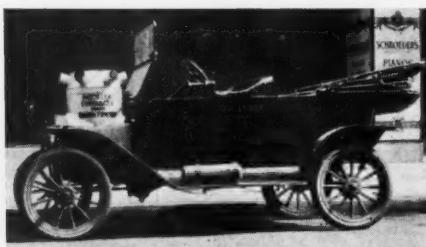
Reduces Cost to Consumer

A farmer who has a motor truck in which to deliver his goods to the market is aiding in reducing the high cost of living 10 to 60 per cent. Had his goods been shipped by rail or boat it would then be necessary for them to pass through ten hands. Shipping by railroads means that some farm products are apt to be spoiled in transit; also, that a middleman must be engaged. Now all of these extra handlings, spoiled goods, and middlemen profits, which could be avoided had a truck been used, have to be borne by the consumer. Therefore, if a truck had been used he would have received a bigger price for his goods for local shipments and the consumer's dollar would have gone much further.

Farmers Compete With Commission Men

Some of the farmers in this locality who own trucks are real live wires. They have regular stands on the Buffalo Elk street wholesale market. Each morning they come to Buffalo with a truck full of farm products and compete against the Buffalo Commission House dealers. From the very start, as anyone can see, these farmers have a tremendous advantage over the commission house men. All of this means that grocers, and the like, can buy foods more cheaply and thus the consumer in turn is able to do likewise.

From the foregoing anyone can see that the truck is used in very many ways by the farmer, and is a valuable asset, of real service.



A Novel Advertising Stunt

No; this is not a new type of a steam automobile, but just a Ford touring car of Heckler Brothers, Pittsburgh, Pa., hot-air furnace builders. A small model hot-air furnace over the engine hood of this car is for advertising purposes only. Heckler Brothers have three Ford touring cars equipped in this way, which attract a great deal of attention wherever they go.

The Boyd Four-Wheel Drive Three-Ton Truck



James Boyd & Brother, Inc., of Philadelphia, well known builders of motor-driven fire apparatus, are announcing a four-wheel-drive 3-ton truck of a standard design for commercial purposes. The four-wheel-drive proposition is not a new one to this company, as for the past five years they have been developing and improving a drive and steer axle which has been used in connection with fire apparatus with great success. It is only recently, however, that they have contemplated going into the commercial line on an extensive scale, with the experimental stage well in the past.

The design is along conservative lines, with strength and durability as the first consideration.

Front Axle

The Boyd patent drive is the distinctive feature of the truck. The center housing of the front axle contains the worm and worm gear, with the full-floating axle shafts extending to the wheels, which are mounted on large double taper roller bearings encased in the bearing houses as shown in the illustration. These housings are carried in yokes forming extensions of the main axle housing and center. Driving and steering is accomplished by the use of an ingeniously arranged compensating or universal joint which is very compact, and is assembled entirely within the front hub with its work-

ing center on the center line of the steering knuckle. The full-floating drive shafts terminate in these universal joints. The shafts at this end have a ball forged integral and a driving pin passing through this ball at its center and perpendicular to the center line of the shaft transmits the drive to a "C" block which oscillates about this pin. This "C" block works at right angles to its motion about the driving pin in an annular groove milled into the hubs, thus transmitting the drive to the hub and wheel. These working parts are well lubricated and protected from the dust and grit by flexible housing.

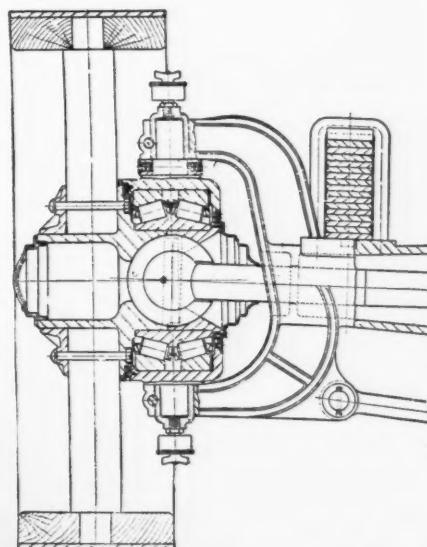
Power Plant and Drive

The engine is the Type UU Wisconsin 4 1/4 x 6 in., four cylinder, 28 h.p., and cotta transmission bolted to the engine, forming a unit type of power plant. The transmission is of the selective, sliding-jaw type,

with gears always in mesh. The drive from the change speed transmission is through a silent chain case, through double universal joint propeller shafts to the front and rear axle.

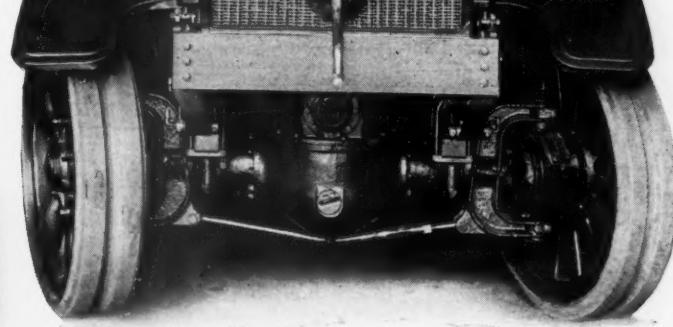
Rear Axle

The rear axle is like the front of worm gear drive. Both service and emergency brakes act on large broad drums, having ample braking surface. The service brake shoes are ribbed to furnish additional cooling surfaces and stiffness.



Sectional View of the Boyd Front-Drive Axle

Showing one of the driving units. The wheels are mounted on double-thrust, taper roller bearings. The drive shaft has a compensating joint at its end at the pivotal center of the steering knuckle, permitting the wheel to be driven and steered at the same time.



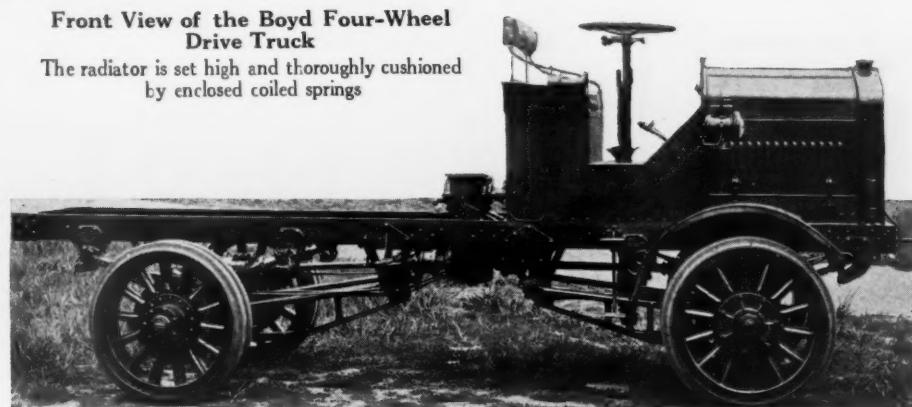
Front View of the Boyd Four-Wheel Drive Truck

The radiator is set high and thoroughly cushioned by enclosed coiled springs



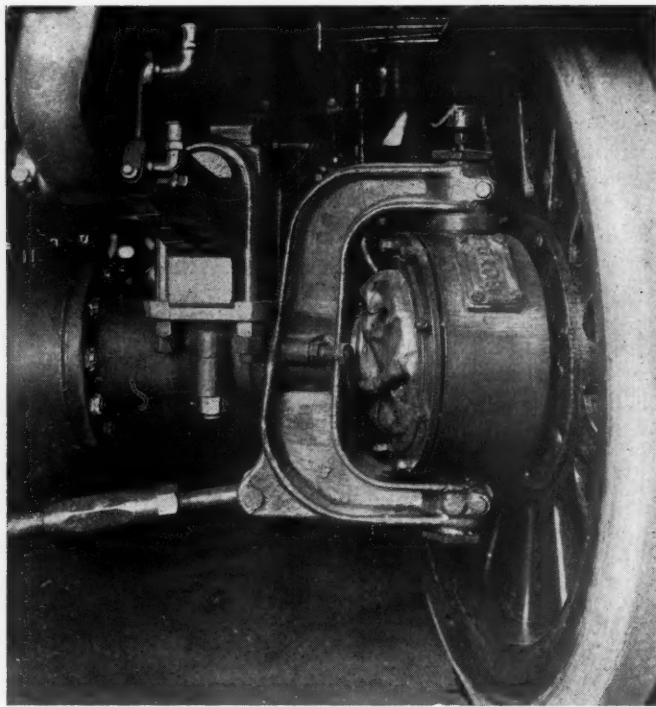
Bird's-Eye View of the Boyd Truck

This view shows the clean-cut lines of the car



Side View of the Boyd Chassis

The similarity of the front and rear of the running gear can be seen distinctly



One of the Boyd Patent Front-Drive Axle Units
All the working parts are well lubricated and protected from the dust and grit by flexible housing

Radiator

The radiator is of the vertical tube type, thoroughly cushioned on coil springs and not utilized in any way for bracing or supporting the hood.

Clutch

The clutch is of the three-plate type with easily accessible and simple adjustments.

Frame

The frame is 6 in. channel section, 35 in. wide, with ample cross members and

gusset plates so arranged to give great strength with flexibility.

Springs

Springs are half-elliptic, 42 x 3 in. front, and 48 x 3 in. rear. The torque of the axles is taken by torque rods and the drive by radius rods.

Steering Gear

The steering gear is the Ross worm and nut type, 18 in. diameter wheel, with spark and throttle control mounted on steering column. The control levers are in the center.

The wheelbase is 129 in.; tread, 63 in.; chassis weight is 7960 lbs.; speed, governed to 12 miles an hour by Duplex Governor.

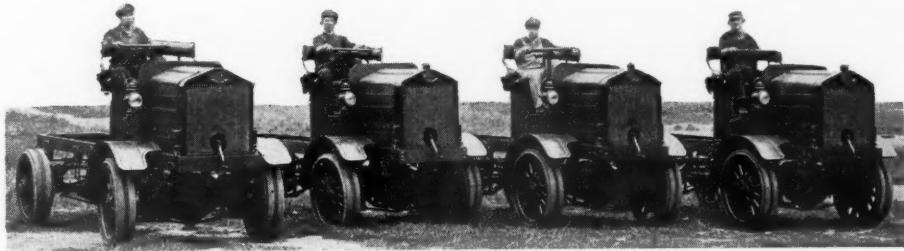
Gasoline tank, pressed steel, of 20 gals. capacity. Equipment: 2 dash oil lamps, 1 oil tail-lamp, jack, horn and full kit of tools. Chassis furnished in lead.

Accessibility and Interchangeability

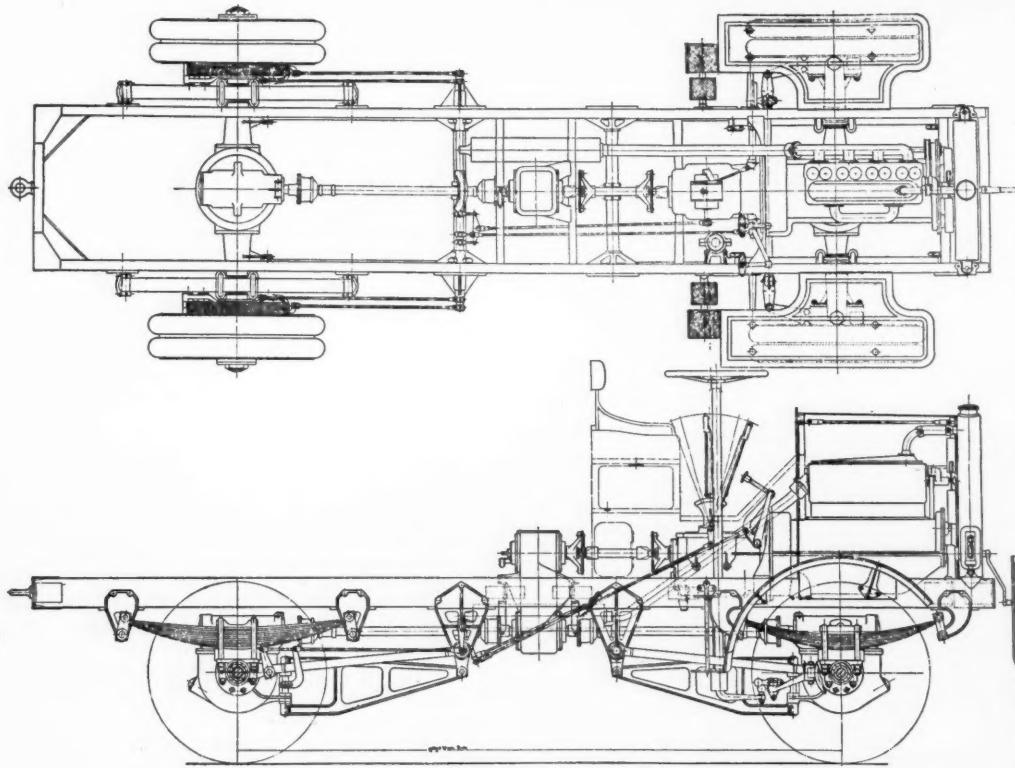
Probably the most interesting feature outside of the drive element is the interchangeability of the chassis parts. In designing the various components of the chassis the idea has been constantly kept in mind of making the front half of the machine the same as the rear half. Therefore, when it should become necessary to order a new part, say a torque rod, radius rod, drive shaft, spring shackle, axle part, then it is simply a matter of ordering that part by name, as these parts are all interchangeable. The front and rear axle worm drive elements are exactly alike.

White Star Motor & Engineering Co., Brooklyn, N. Y., has been taken over by the Metropolitan Motors Co., capitalized at \$1,000,000. The White Star 2, 3 and 5-ton trucks will be continued and in addition the company will bring out a $\frac{1}{2}$ -ton light delivery car, listing at \$695.

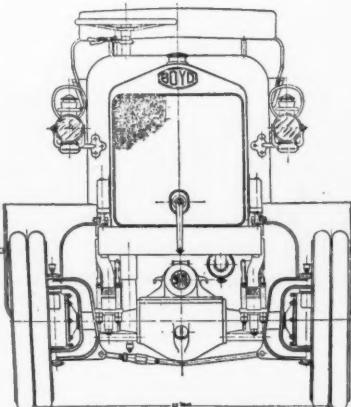
The Kramer Governor will hereafter be marketed by the Monarch Governor Co., who will be exclusive selling agent for the governors under the trade names Monarch and Kramer.



Line-up of Boyd Four-Wheel Drive Machines
Wheelbase, 129 in.; tread, 63 in.; chassis weight, 7960 lbs.



**Plan, Side Elevation and
End Views of the Boyd
Four-Wheel Drive
Three-Ton Truck**



The Firestone
Removable
Rim
Always
Works

Proved by Many
Years of
Success in
Hardest
Service

A Firestone Factor of Efficient Truck Tire Service

which has proved its success wherever trucks are operated is the S.A.E. Removable Rim Equipment. Years of the hardest use in many varied lines have established the Firestone as standard equipment, always dependable.

With this equipment any driver can change tires in a few minutes, without removing the wheel from the truck. It makes a great addition to the actual running time of truck service.

Fifteen years of tire development by the most highly specialized experts ever assembled in one institution, have wrought the Firestone "Most Miles per Dollar" design and quality—toughness

that gives longest wear combined with resiliency that protects the truck mechanism. This accounts for the fact that by far more Firestone Truck tires are in use than of any other one make.

There is a Firestone Tire for every demand and a Firestone Service Station in every trucking center with specialists to give you the benefit of their experience and counsel. Call the Firestone headquarters nearest you for details and low prices.

Firestone Tire and Rubber Co., Akron, Ohio—Branches and Dealers Everywhere
"America's Largest Exclusive Tire and Rim Makers"

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stone
Special
Electric
Truck Tire
Increases
Speed and
Mileage
HIGHEST
EFFICIENCY

There
is a
Firestone
for Every
Load, Road
and Condition
of Service

Firestone
TRUCK TIRES

Rainier Thousand Pound Commercial Car

By C. P. SHATTUCK



IN presenting the Rainier truck its makers, the Essex Motor Truck Co., with offices at 299 Madison Avenue, New York, and factory at Long Island City, are confident that they have met every requirement of the discriminating business man desiring a strictly high-grade 1000 lb. capacity gasoline vehicle, one that can be economically operated and maintained. The chassis has several features not usually found in a truck of similar capacity; notably the 115 in. wheelbase and worm drive. It is the design of Carl A. Neracher, formerly chief engineer of the Willys-Overland Co. and Garford Co., who has incorporated the ideas of two pioneers of the truck industry, John T. Rainier and Paul N. Lineberger, president and vice-president, respectively, of the company. It is interesting to note that their experience dates back to 1901 and it includes both gas and electric vehicles. In 1902 they established what is said to have been the first truck service station in New York, and they also are credited with having exhibited the first commercial car displayed at a Madison Square Garden automobile show.

The Rainier chassis is to be marketed at \$850 f.o.b. New York and it comes completely equipped. Electric lighting and starting is furnished if desired at an extra charge. Three types of unusually well designed and attractive bodies in standard colors are offered at \$110 and \$125, and special colors will be supplied at \$25 extra.

Details of the Power Plant

The engine is a four-cylinder of the L-head type, having a bore of $3\frac{1}{4}$ in. and stroke of $4\frac{1}{2}$ in., and although rated at 16.92 h.p. by the S. A. E. rating, develops 28 h.p. at 2000 r.p.m. The cylinders, crankcase and exhaust manifold are cast integral,

making for light weight and rigidity. The use of a two-bearing crankshaft affords compactness and the bearings are $2\frac{1}{4}$ and $2\frac{1}{2}$ in. long, front and rear, respectively. These and the camshaft and connecting-rod bearings are die cast nickel babbitt. The bearings are first fitted, then broached with a special fixture, then line reamed and burnished, a method obtaining a perfect seat. The connecting-rods are $9\frac{1}{2}$ in. between centres, are of 35-40 carbon steel, and the lower ends are split. The cap is retained by nickel steel bolts. The connecting-rods are drop forgings, heat treated, and the upper ends are bronze bushed, forming a bearing for the wristpins. The pistons are cast iron and are machined from the inside of the casting to insure uniform thickness of the walls. They are heat treated and ground to size. The wristpins are hollow, ground to size, and are tested for hardness. The pins are retained by set screws in the bosses.

Helical timing gears are employed of $\frac{7}{8}$ in. face, mild steel meshing with cast iron. The crankshaft gear has grooves in its inner face, which collect oil from the overflow pipe, and the grooves communicate with holes between the teeth of the gears, insuring efficient lubrication. The valves are $1\frac{3}{8}$ in. diameter in the clear

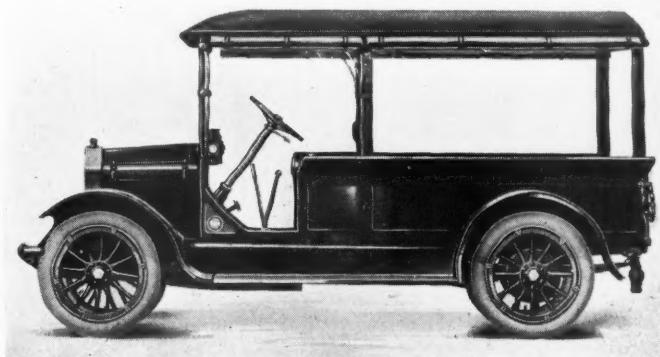
opening and are enclosed by easily detached plates.

Cooling is by the thermo-syphon system, and as the water jackets are ample in size and the valve ports are entirely surrounded by water, an efficient operating temperature should be maintained under all kinds of service. The exhaust manifold is ribbed to assist in cooling and the inlet and outlet pipes are generous sized. A flat, vertical tube type of radiator is so mounted as to prevent road shocks being communicated to it, and the fan is an adjustable, two-bladed aeroplane type.

Lubrication is by a combined force feed and splash. The pump is of the plunger type, actuated by an eccentric on the cam-shaft. The lubricant is pumped from the reservoir and through a screen and a duct in the oil pan to troughs under each connecting-rod. The oil is splashed to supply pockets over the main bearings, to the camshaft bearings, gears and cylinder walls. The pistons have drain back oil holes in the bottom ring to prevent smoking. The usual dash oil gage is included.

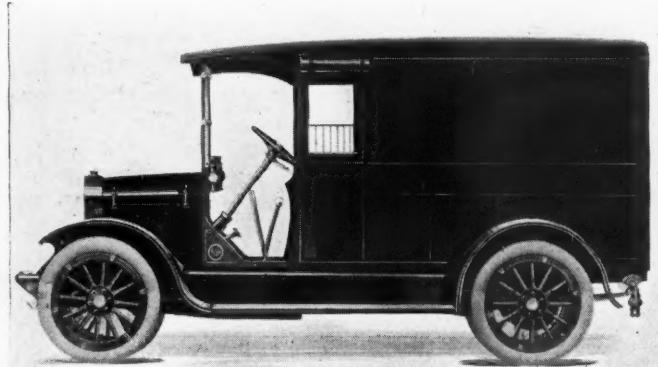
Ignition is by a Dixie true high tension magneto and the carburetor is a Carter multiple jet with air control located on dash. Simplicity and efficiency are features emphasized of the clutch, which is a three-plate, asbestos to steel, with plates 10 in. in diameter. It is stated that adjustments can be made in five minutes by simply shifting two bolts, which register with slots. The gearset is of the selective type, affording the conventional three forward speeds and a reverse. The shafts and gears are of nickel steel, and the gear case is very compact. It includes a bell housing, which bolts to the engine, a unit power plant.

The front axle is a Timken-Detroit drop forging, heat treated, and having $2\frac{1}{2}$ in. sections. The steering knuckles are extra large



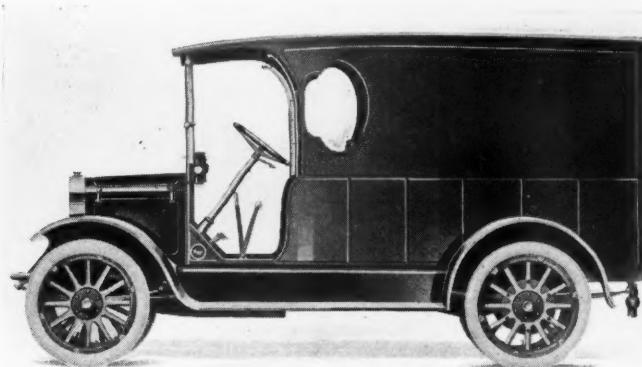
Rainier Thousand Pound Capacity Truck

The new vehicle has a wheelbase of 115 inches, is worm-driven and has a novel spring suspension. The body is listed as Style E and sells for \$100.||



Rainier Style S, Panel Body

This style body provides a loading space of $73\frac{1}{2} \times 44 \times 60$ inches and sells for \$110.



Rainier Thousand Pound Truck

The driver is placed at the left, with center control. Note the unusual method of locating the side lamps. Panel Body, Style A, Price \$125.

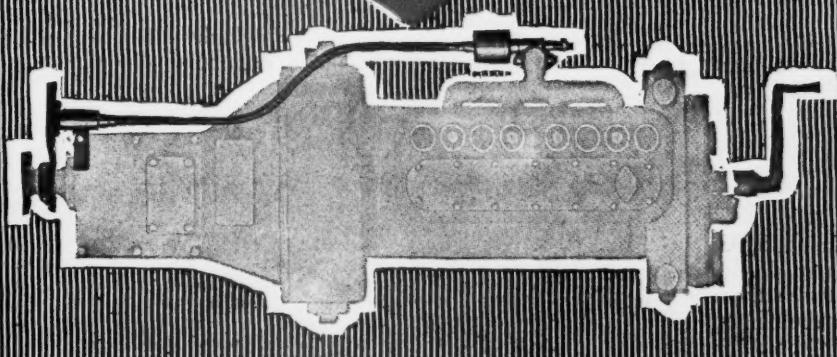
Used by all who place Quality first

PIERCE

Wherever you find the other Leaders, look for the Pierce Governor. It has received the very highest recognition from the leading American Truck Manufacturers—They USE it.

PIERCE
GOVERNOR
CO.

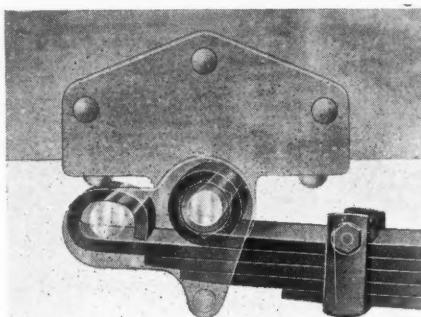
Anderson, Ind.
U. S. A.



and are forged from nickel steel. The rear axle is the latest type Timken David-Brown worm. The frame is of 5-32 in. pressed steel with $4\frac{1}{2}$ in. channel and is narrowed at front to afford a short turning radius. It provides a space of 74 in. behind the driver's seat. Power is transmitted through a tubular shaft with a universal joint in back of the gearset and another in front of the rear axle. It is practically a straight line drive. The Hotchkiss method of drive is utilized and includes a special safety spring shackle.

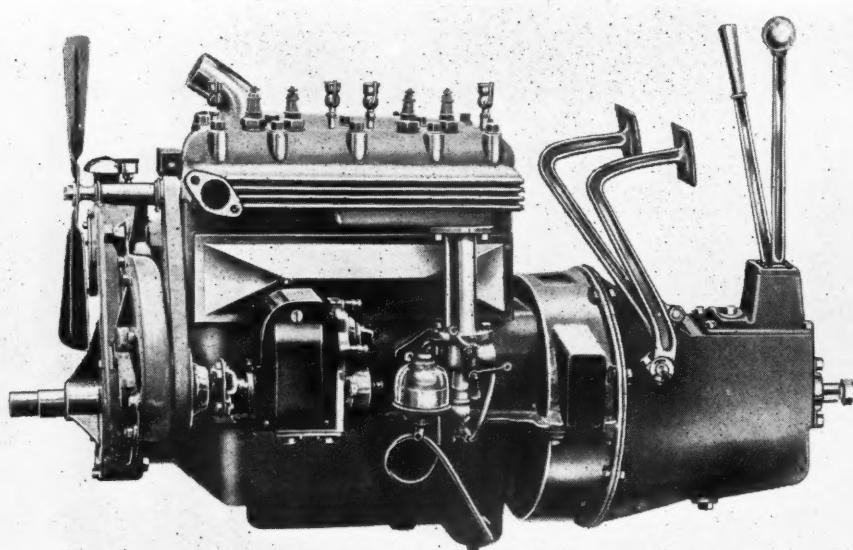
The spring material is a high-grade spring steel and the front springs are 38 in. long, 2 in. wide and have seven leaves. The rear members are 50 in. long, $2\frac{1}{4}$ in. wide and have eight leaves. The feature of the construction of the rear springs is the safety double shackle. In addition to the usual eye on the main leaf the second leaf is extended and is formed into an elongated eye, allowance being made for deflection under load. The eye of the main

ously stated, being a Dixie. The wheelbase is 115 in. and tread standard, 56. The capacity of the fuel tank, located under the driver's seat, is $14\frac{1}{2}$ gals. The fuel supply is by gravity. The second growth grade of hickory wheels with $1\frac{1}{2}$ in. spokes are



Rainier Double-Spring Safety Shackle

In the event of the main leaf breaking the second takes the drive



The Rainier 28 H.P. Power Plant

The engine of the Rainier truck is noticeable for its compactness and has the usual removable cylinder head

leaf is attached to the frame by the usual rigid spring bolt. Additional means of support are furnished by clamps on either side of the springs, one by a pin through the elongated eye, and the other by a pin through the lower end of the clamp, which takes in the third and fourth leaves. It is pointed out that in case of the main leaf breaking, the eye of the second becomes the driving eye and should this break the spring will wedge between the under pin and the upper part of the clamp, thus obtaining rigidity which is essential with the Hotchkiss method of drive. Two sets of brakes are provided, these being of the internal expanding duplex type, acting on 14 in. wheel drums.

The steering gear is a worm and sector irreversible type and the wheel is 18 in. in diameter. The drive is located at the left, with centre control. The usual accelerator is provided and the throttle is placed on the steering wheel, but the spark control is on the dash, the magneto, as previ-

equipped with quick detachable, quick demountable rims, fitted with 33 x 4 in. tires. The equipment includes one extra rim, front fenders, running boards, three oil lamps, wrought iron bumper, Piel horn, tire pump, jack and tools. The speed of the vehicle is from 25 to 30 miles an hour

and it is stated that the car is very economical of fuel and of tires.

The types of bodies include one express and two panel. The former provides inside dimensions of 74 in. long and 44 in. wide. The standard colors are green body with red crest panel, red wheels, and fenders and chassis black. The Model S panel body affords a loading space of $73\frac{1}{2}$ in. long, 44 in. wide and 60 in. high. The body is painted a dark blue and black, wheels red, and hood, fender and chassis black. The Model A panel body has inside measurements of $73\frac{1}{2}$ in. long, 44 in. wide and 60 in. high. Its colors are body and wheels maroon, hood, fenders and chassis black.

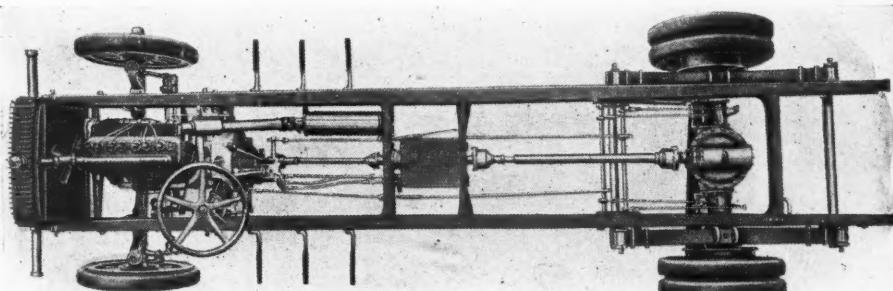
SERVICE BRINGS OUT NEW MODEL 175, THREE AND A HALF TONS CAPACITY

The Service Motor Truck Co., Wabash, Ind., has announced a new model, known as Model 175, and is specially built to meet contractors' requirements and for other uses necessitating greater power to meet special conditions. The engine is a Buda, $4\frac{1}{2} \times 6$ in. bore and stroke. Large carburetor is used and there is an extra heavy radiator with cast tank. The clutch, transmission and propeller shaft are all of ample size to properly transmit the increased power. Other specifications are the same as Model 170, $3\frac{1}{2}$ -ton model. Briefly these specifications are:

Stromberg carburetor, Eisemann dual system of ignition, dry plate clutch in unit with engine, Brown-Lipe selective transmission, tubular propeller shafts between clutch and transmission and also between transmission and worm drive axle, each shaft provided with universal joints at both ends, Timken-David Brown worm drive axle, full floating, Timken front axle, double brakes, left side drive, center control. Ross steering gear, semi-elliptic springs, 36 x 5 in. tires, single front, dual rear; 170 in. wheelbase.

Service Five-Ton Model

The service 5-ton model is known as Model 200. It has the same make and size engine as Model 175. Tires are 36 x 6 in. front, 40 x 6 in. dual rear; chassis weight, 6800 lbs.; chassis price, \$4000. With the exception that dimensions are larger, the other specifications are very similar to Model 175.



Top View of Service Five-Ton Chassis

Has Buda $4\frac{1}{2} \times 6$ in. engine, Brown-Lipe transmission, heavy radiator with cast tank; total weight of chassis, 6800 lbs.

RAYFORD OF INTERNAL-GEAR TYPE

The latest production of the Rayford Co., Second and Indiana Ave., Philadelphia, Pa., is a new unit for converting the Ford car into a one-ton truck. This unit, however, is of the internal gear type and differs from other units in the fact that it uses the Ford rear axle without cutting it down or without the axle carrying any of the weight on the truck. In other words, the Ford axle is used as a housing for the live rotating axle, the ends of which are supplied with spur gears, which mesh with internal gears in special cast dished steel wheels.

Another feature of the construction is the fact that the tread is still 56 in., although the Ford rear axle is not in any way cut down or machined. The simplicity of the construction is shown by the accompanying illustration. The wheels of the rear axle are removed and spur gears are attached to the hub. These wheels are used on the front of the car, the rear wheels of the Ford being somewhat heavier than the front wheels. The new internal gear Rayford unit has special wheels, which are steel castings, somewhat dished in form.

The ends of the Ford axle have spur gears, which mesh directly with internal gears in the steel wheels. These internal gears are made in six removable sections to facilitate repairs and cut down the cost of same. These steel wheels are mounted on Bower roller bearings. The tire equipment on these wheels is 32 x 3½ in. solid. The load carrying axle is an I-beam, 3 in. in depth, by 1⅛ in. On this

are mounted the heavy, long, flat leaf springs, which carry on the usual mounting the heavy channel section steel frame, the channel being 4 in. in depth. This extends the Ford frame, so that the wheelbase is 124 in. The Ford axle itself is supported suitably to this load carrying I-beam axle at either side of the differential housing at center and at each end. This axle, of course, carries no load whatever, but merely acts as a housing covering the live axle within it, which transmits the torque to the wheels, the same as is done in any internal gear drive axle construction. Although the outfit gives a standard tread of 56 in., it can be had in 60 in. tread for southern roads, if desired. The unit sells complete for \$300.

COMPLAINTS LESSEN WITH DELIVERY CARS

Berg Bros. of Philadelphia, find a decrease in complaints of 75 per cent. after installing automobile delivery service. The delivery system in progressive stores and businesses of the country has been undergoing a steady transition. Surely and completely the delivery car has been supplanting the horse and wagon. Naturally, to the average person, department stores have been conspicuous examples of the change.

Berg Bros. is one of Philadelphia's large department stores. Its treasurer, Jules Mastbaum, speaking on the subject, recently said:

"When Berg Bros. was reorganized, we immediately set out to improve our delivery service. Our deliveries had been handled

by an outside concern on a contract basis. They supplied horses, wagons and drivers. We immediately took over our own deliveries, and soon found that horses and wagons were not satisfactory. Horse and wagon deliveries cost more money than gasoline car deliveries, and did less work. Horses were slow and apt to become disabled by illness, especially in the summer time.

"There are many types of delivery cars and trucks. Each type is designed for some particular use. The heavy truck will not do the work of the light car and vice versa."

"Berg Bros. wanted to start right, and exercised discrimination in picking out the car they thought best for their business.

"We wanted a business car built for business purposes and purchased six Vims. They have proved a success, and we are using them entirely for our light deliveries.

"Since the change in our delivery system, we can see not alone convenient deliveries to the trade we already had, but a positive increase of business in certain directions.

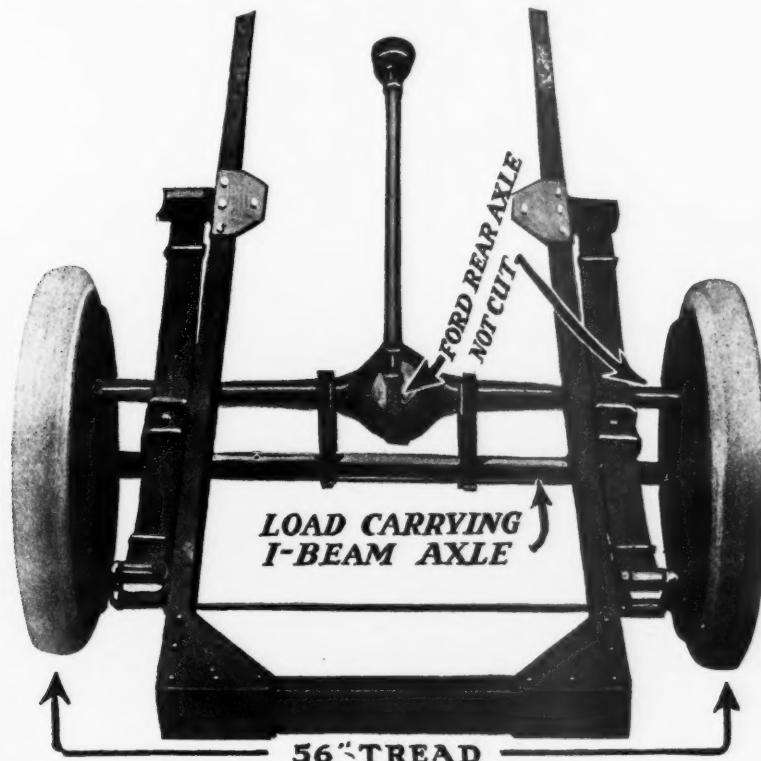
"Retail stores in general have been reaching further and further, getting in country districts, even going out of their own States. Cheap and quick deliveries have made this possible."

"With horses and wagons our delivery radius was limited. With the machine we can go much farther, can cover not alone Philadelphia, but the entire adjacent suburban district. We notice, for example, a distinct growth in our New Jersey business, since the introduction of motor delivery service. Complaints of non-delivery or late delivery are a constant source of vexation to any business. This is particularly true wherever numerous small parcels are to be sent a far distance.

"Each machine makes two trips a day. It delivers about a hundred parcels on each trip and its daily mileage is from 50 to 80 miles. A horse, limited by animal endurance, would be doing well to average sixteen miles per day.

"In regular city deliveries, one machine will replace two teams of two horses each, or four horses in all. On longer trips to the suburbs, such as Germantown for example, a car will replace three double teams of two horses, or six horses in all. We figure that department store expenses with a Vim are heavier than the cost to an average user, as it has many stops to make, and goes through traffic a great deal, the hardest kind of service. In spite of this, however, the running cost is about the same as that of one team.

"While Department stores are more or less in a class by themselves, every concern delivering many parcels has the same problems to meet. Department stores are apt to have the widest experience, and the results they obtain should be valuable to many smaller merchants."



With this unit the weight is carried on a solid I-section axle; but the Ford rear axle is retained and fitted with spur gears, which mesh with internal gears in the cast-steel wheels on the solid axle. The outfit sells complete for \$300.

The CCJ has most readers because it gives most information

Adams Truck, Foundry & Machine Co., Findlay, O., has temporarily discontinued the manufacture of Adams commercial vehicles in order to concentrate on foundry and machine shop work.

The Commercial Car Situation in Buffalo

By GEORGE W. GRUPP

ALL motor truck dealers, at some time in their careers, must of necessity give thought on the question of future and present conditions in their business. Some of the Buffalo dealers look upon the present and future motor truck situation as a mountain of big problems. At times, some of them think that the very bottom has dropped out of the Buffalo motor truck business can, while at other times it seems to overflow with prosperity. But this feeling of optimism and pessimism is not brought about by accident. On the contrary, it is brought on by the actual conditions which confront the dealers.

All of this being so, it would be well to look into the Buffalo motor truck situation—seeing it as some of the dealers do. Therefore, when I asked Jack Sanderson, agent for the Service, about this question, this is what he said: "At present, Buffalo is one of the worst motor truck fields in the world. This is due to several causes. First, Buffalo is surrounded by a rich farming district. And the farmers who own these farms are more progressive than the Buffalonians. As a result, they buy trucks and then sell their horses to Buffalo people, thus flooding Buffalo with more horses. Second, Buffalo is the second largest horse market in the United States and people come to this market from all over to buy and sell. Third, Buffalo's freight terminals are situated very near to the big wholesale houses, therefore they only have short hauls, or as in some cases none at all, as the cars are backed up to their doors. And fourth," he said, good-naturedly, "our streets are too well paved and we haven't any hills in Buffalo to help kill all, as the cars are backed up to their live one month, under our splendid street conditions live six months. Now that's altogether too long.

"Now there is only one way to solve this problem," he continued. "Every dealer must pick out one particular line of business and then work it for all it is worth. Get some of them started and the others will be compelled to follow suit, because their truck using competitor will be able to make twice as many calls and in less time. Now this will mean that his competitor will have to get a truck or lose trade, because what the people want today is quick delivery service."

E. B. Olmsted

E. B. Olmsted, distributor of the Diamond T, took a more optimistic view of the Buffalo situation. He said: "The opportunities for selling trucks in Buffalo are good. We have in this city a large number of industries. This in itself is a big field, for both present and future trade. These industrial concerns make long hauls, and in this particular the truck excels.

"There are two things, however, which I do not like about our present situation. One is the slowness of truck deliveries from the factories, and the other is that most heart-breaking business called cutting prices. This cutting of prices scares most heart-breaking business called cutter, I believe that the future will see some radical changes in selling and an increase in sales will result."

A. J. Borst, Jr.

Another live wire dealer who had something to say on this subject was A. J. Borst, Jr., of Borst-Damon Co., Inc., agents for the Republic, Vim and other makes of trucks. His remarks on the subject were these: "Buffalo is an excellent motor truck market. Why, do you know, only one-tenth of all the eligible owners use trucks? This is encouraging to any red-blooded man who has push in him, and who is not afraid of hard work.

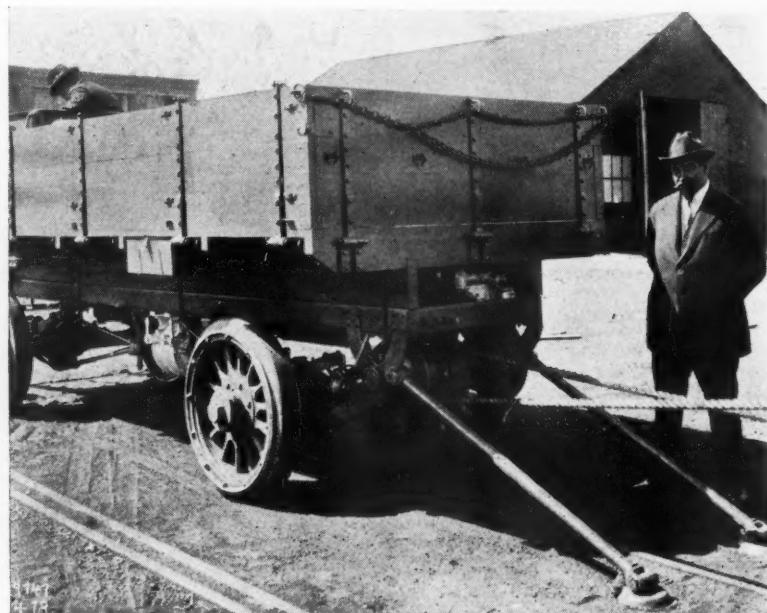
"There is only one thing of which I complain. It is the cutting of prices. This sort of practice retards the progress of the motor truck idea. How does it retard progress, you ask? Well, it's because the dealers who cut prices can't give real service. And for this reason,—the lack of real service in the trade generally, caused by the cutting of prices, makes every prospective buyer think a very long time before he buys as he thinks all dealers are alike. And just because we (Borst-Damon Co., Inc.) refuse to cut prices we find that we

are losing twenty-five sales each month. We refuse to sell a truck under catalog price and as a result we are in a position to offer real service to our buyer."

No doubt the reader will recognize that some of these conditions prevail in his respective town. But this practice of cutting prices, which is the most trying of them all, should not be tolerated by dealers—because it will not be long and the people will begin to ask themselves, "Why go to a dealer when I can buy a truck just as cheaply from the factory?" Every dealer should recognize that a sale is not a mere exchange of goods for money, but an exchange of goods for money with just profits for services rendered as a salesman. And every dealer who is selling under the catalog price is not only unfair to his competitors, but he is dealing dishonestly with himself.

But in spite of all the foregoing non-ideal conditions the motor truck situation in Buffalo in the future will become more idealistic, as the dealers themselves say, and the outlook upon future sales in Buffalo is most encouraging.

Hub Motor Truck Co., Columbus, Ohio, has been organized for the purpose of manufacturing gasoline-electric commercial cars. The officers are: John L. Herpich, president; Henry Immel, secretary, and L. R. Yeager, general manager. The trucks are to have a capacity of $2\frac{1}{2}$ tons and the first one will be ready for delivery in the fall.



FWD Truck With Winch

Used by the Russian Imperial Government. The Four Wheel Drive Auto Company, Clintonville, Wis., is the manufacturer, and the firm states that there are 130 of this type of truck in use in Russia. For the 1917 season, the three-ton FWD will be made exclusively, the one and a half and five-ton models having been dropped.

Stewart

Delivery Trucks

are big money makers for dealers. A Chicago dealer sold 12 demonstrators in less than a week. From Minneapolis, Minn., our dealer ordered 36 more one week after receipt of demonstrators. Our Boston agent sold as many Stewart Trucks in the first two months as all last year. The San Francisco dealer had been handling another line, but changed to Stewart and ordered a train load for quick delivery. And so it goes—we could cite any number of such instances.

A Stewart Agency Means Great Success

It is no wonder Stewart Trucks are having such a demand when the Stewart

Quality is well understood. These trucks are built right—just as trucks should be—and for four years have been making remarkable records for economy and reliability. The line is a popular one consisting of

1,000 pound	—chassis	—\$ 695
$\frac{3}{4}$ ton	—chassis	1290
$1\frac{1}{2}$ ton	—chassis	1390

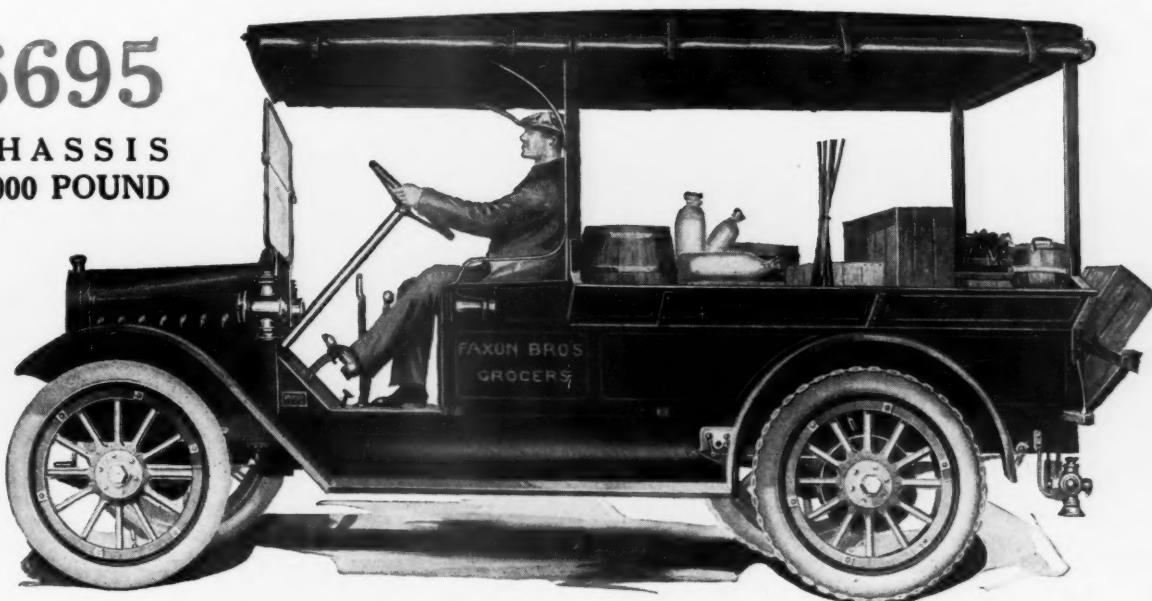
The overwhelming demand has made it necessary for us to add tremendously to our output. Our facilities are being increased to meet the demand. Dealers will not be held up on delivery. A country-wide advertising campaign will make the merits of Stewart Trucks known to every possible prospect.

Dealers: Here's a money-making proposition. Write or wire at once.

Quality Trucks at Quantity Prices

\$695

CHASSIS
1,000 POUND



Stewart Motor Corporation, Buffalo, N. Y.

Factory News Items

Kopp Motor Truck Co., formerly located at rear of 49 E. Utica St., Buffalo, N. Y., has moved to 30 Sycamore St.

Schleher Engineering Co. has moved to larger quarters at 226 Ionic St. and 119-23 S. American St., Philadelphia, Pa.

Autocar Co., Ardmore, Pa., has declared a cash dividend of 5 per cent. The paid-in capital has been increased from \$300,000 to \$1,800,000.

Cortland Cart & Carriage Co., Sidney, N. Y., maker of the Hatfield motor trucks, has increased its capital stock from \$75,000 to \$225,000.

Covert Motor Vehicle Co., Lockport, N. Y., will add to its present plant a three-story and basement factory, 100 x 130 ft., to cost \$40,000.

Sterling Motor Truck Co., Milwaukee, Wis., has opened a factory branch in Chicago under the name of the Sterling Motor Truck Co., of Chicago, with W. F. Wittenberg as manager.

Service Motor Truck Co., Wabash, Ind., increased its capital stock \$100,000 by an issue of preferred certificates, the proceeds of which will be used in the extension of the business.

Standard Motor Truck Co., Detroit, will take possession of its new 3-story concrete building on Bellevue Ave. September 1. The building will cover 60,000 sq. ft. of floor space and will be equipped with modern machinery.

Republic Motor Truck Co., Alma, Mich., has increased its capital from \$250,000 to \$1,000,000. The money obtained by the new stock will be used to improve a tract of ground the company has purchased and will triple the output.

Mayo Mfg. Co., 54-60 E. 18th St., Chicago, has been succeeded by the Mayo-Skinner Mfg. Co. The manufacture of automobile supplies and accessories will be continued on an increased scale. The personnel of the company will remain unchanged.

Warner Mfg. Co., Beloit, Wis., will shortly put on the market heavy duty trailers of 2, 3 and 5 tons capacity. The Warner trailer coupling will be standard equipment on the trucks manufactured by several of the best-known truck makers in the United States.

Locomobile Co. of America, Bridgeport, Conn., maker of fine pleasure and commercial cars, announces that the gross value of domestic business for the quarter ending June 30, 1916, exceeded that of the same period of last year by about a million dollars.

Packard Motor Car Co., Detroit, Mich., received an order from the United States War Department for 198 additional Packard chainless motor trucks for use on the Mexican border. This makes a total of 716 trucks of this type purchased by the government.

White Motors Co., New Haven, Conn., 2-story building at 264-66 Crown St. Over 24,000 ft. will be provided for and the ground floor will be used for showroom and general offices, while the rest of the building will be devoted to service work and a large stock room for spare parts.

Wray-Chase Motor Service Co., Cincinnati, O., agents for Garford and Stewart trucks, has changed its name to the Chase Motor Service Co., owing to the retirement of J. Morris Wray from the company. Its office will be at 804 Union Trust Building, with an up-to-date service station at 1050-62 Hulbert Avenue.

Chase Motor Truck Co., of Syracuse, N. Y., will shortly announce a new Chase model to be known as Model "X," a 3-ton worm drive job to retail at \$2800, equipped with cab. This new model will round out a line of Chase worm drive trucks of $\frac{3}{4}$ -ton, 1-ton, $1\frac{1}{2}$ -ton, 3-ton and $3\frac{1}{2}$ -ton carrying capacities.

Atterbury Motor Truck Co., Buffalo, N. Y., despite its recent fire, which caused a damage of \$100,000, is continuing to do business. About three-quarters of the plant is still in working condition and orders can be filled within a week's time. The most of the loss is covered by insurance. The structure will be rebuilt as soon as the insurance adjusters finish their work.

Ohio Tractor Mfg. Co.'s personal property has been bought by the Houghton Sulky Co., of Marion, O. The property has been in the hands of Chas. H. Lewis as receiver for some time. The sale includes all the material on hand, patterns, machinery and finished product. It is thought that Mr. Houghton and his associates will purchase the building as soon as court proceedings can be compiled with and a truck or automobile factory will be operated. A reorganization has taken place and Ellis H. Houghton has been elected general manager of the tractor property.

THE FEDERAL MOTOR TRUCK Co., Detroit, Mich., has issued their new Blue Book of Traffic. In the 64 pages between the covers of this new book over fifty different lines of business are featured and in addition considerable space is devoted to detailed description of the various units and the construction of the Federal. The book is a comprehensive treatise on motor trucks, compiled in such a manner as to make the subject of motor trucks an interesting one to the ordinary layman.

OTTOFY PATENT ON STREET FLUSHERS BOUGHT BY STUDEBAKER

The Studebaker Municipal Utilities Co. has been organized for the purpose of acquiring the Ottofy Patent No. 795059 from the Syndicate Street Flushing Machine Co. The Studebaker Corp. is now owner of this and various other patents covering the modern way of street flushing. Flushers manufactured under this patent will in the future be marketed by the vehicle division of the Studebaker organization. The Ottofy patent covered "any flushing machine made or that can be changed or adjusted to deliver a flat stream of water under pressure forward or latterly at an angle of 20 degrees or less."

Shattuck Trailer Co., 405 Palace Bldg., Minneapolis, Minn., moved to 1408-10 Hennepin Ave.

Sterling Motor Truck Co., Inc., of Chicago, is now located at 1324 S. Michigan Ave., Chicago, Ill.

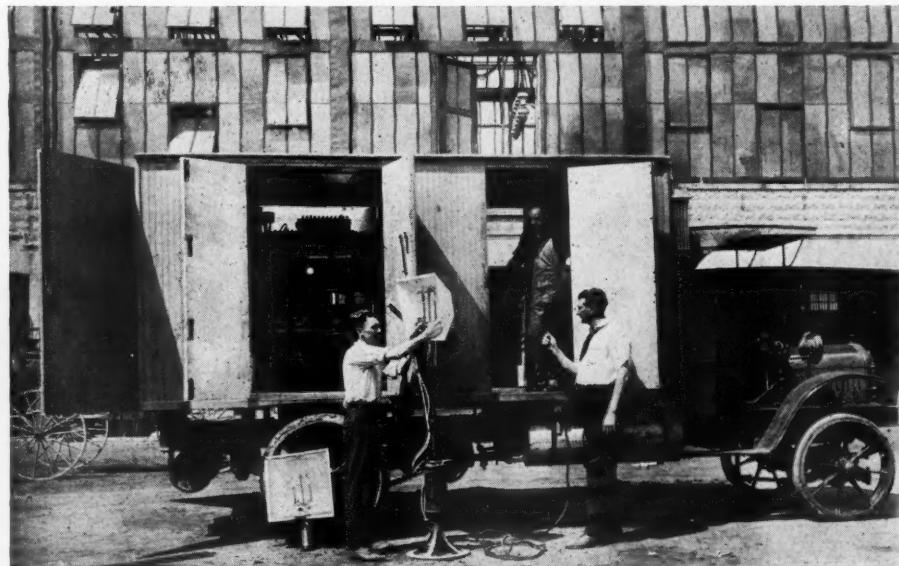
Denby Motor Truck Co. of Detroit is arranging to open up a branch house at 1213-15 Locust St., Des Moines, Ia.

Swain-Hickman Co., distributors of the Republic truck, is now located in its new service station on Fair St., Trenton, N. J.

James Motor Co., 1507-11 Michigan Ave., Chicago, Ill., distributors of Velie and Denby trucks, will move its service station to 1718 Indiana Ave.

Elmira Commercial Car Co., Owego, N. Y., has been formed for the purpose of manufacturing a 1000 lb. delivery car, listing at \$425. The cars will be ready for delivery about January 1st next.

International Motor Co., New York, N. Y., builder of Mack and Saurer trucks, has adopted the N. A. C. C. Standard Service Policy, which was adopted by the National Automobile Chamber of Commerce, January 8, 1916.



Vitagraph Dynamo Car

The Vitagraph Company of America has added a dynamo car to its fleet, to provide a portable and adequate lighting system for motion-picture photography. In remote sections of Long Island, when it was desired to take motion pictures at night, the company was often handicapped by not having available a current supply. The car is a five-ton White. The car has two compartments, the front containing a 218 ampere 120 volt dynamo, and the rear a five-cylinder marine gasoline engine of 50 h.p. The entire body is of galvanized iron for fireproofing and has heavy rubber floor mats for insulation. On either side of driver's seat is located vertical tube radiators for cooling the marine engine. These radiators and all machine work for all the other accessories were done in the Vitagraph shops. It is said this portable electric plant could easily light three city blocks.



On the Job

Nothing stronger could be said about any truck. And it is this feature of being "always on the job" that is the very backbone of Signal success.

It is recognition of the fact that a truck pays a profit only when it's hauling, not when it is standing idle, that led to the wonderful simplicity of Signal design and the quality of Signal construction.

The Signal Truck has the cleanest mechanism in the business. It's clean in two ways. First, it's clean because it's simple—not an unnecessary bolt or lug—no frills. Second, it's clean because every constructional unit—motor—transmission—axles—steering gear—frame—springs—wheels—tires—magneto—every unit is the best that can be built regardless of price or any other consideration—there's no room for suspicion that *any* feature *might* be better.

When you absorb that fact, you will have the secret and the backbone of Signal success—and why Signal sales are rolling up faster than ever.

Write at once for full details of the Signal Line

Signal Motor Truck Company

Detroit, Michigan



5

5

Commercial Cars Feed New York

The Use of Trucks in the Produce Business In and Around New York City Steadily Increasing. Trucks Come From a Radius of Fifty to Seventy Miles

By C. L. EDHOLM

THE commercial car plays an important part in feeding the eight million population of Greater New York, and a considerable part of the motor truck's service in this essential task is the hauling of products of the farm to the city markets and wholesale houses. From Long Island and New Jersey the endless streams of traffic flow through the midnight hours and reach their destination long before dawn, the Washington Markets, the Harlem and the Wallabout, which are scenes of intense commercial activity while the rest of the city sleeps.

From a radius of fifty to seventy miles the commercial cars bring their loads of food for the following day's consumption;

the city markets by the motor. It may be mentioned here that while in some lines of business the utility of the truck is recognized, so that it is merely a question of which type of truck is most desirable in the gardening and marketing line, the horse is still the standard of comparison; it is not a case of convincing the market gardener that Smith's truck is better than Jones's or Robinson's, but that the truck is more efficient and economical than Dobbin.

That such is the case is demonstrated by the experience of men who have tried both means of transportation on an extensive scale. Perhaps the most extensive use of trucks for this purpose in and about New York is the N. Y. Live Poultry Trucking Co., which has offices in Hoboken and at

so that at present he is operating a fleet of ten commercial cars, and selling the horses that they replace. Last May he sold twenty horses at one time.

This fleet consists of seven White trucks, a three-ton machine and six five-tonners; two five-ton Macks and a 4-ton Packard. This is not the end, for Mr. Feinstein said that he expected to add to his commercial cars from time to time as they were far more efficient and cheaper to operate except for short hauls and long stops than the horse trucks. The big trucks carry their loads of live poultry piled high above the driver's seat, large crates containing three dozen fowls each. A driver and helper accompany the cars as a rule, though sometimes the driver alone is sufficient.

These machines make an average of from fifty to seventy miles every day and work within a radius of thirty miles. They cover distances that would be impracticable for horse-drawn vehicles, and their speed is an important factor in getting the fowls to market in the best possible condition.

The economy of the truck must be beyond question to convince a hard headed business man like Mr. Feinstein, who has daily opportunity to compare both methods of transportation. The average truck gardener or farmer has not this opportunity, but when the ice is once broken, when he finally tries a truck he finds that it is more profitable than the lumbering team, that is liable to be out of service just when it is needed the most. The truck that does not mind the heat of summer and that travels with ease in the worst weather of winter is the kind of reliable transportation that the farmer needs for his perishable commodities.

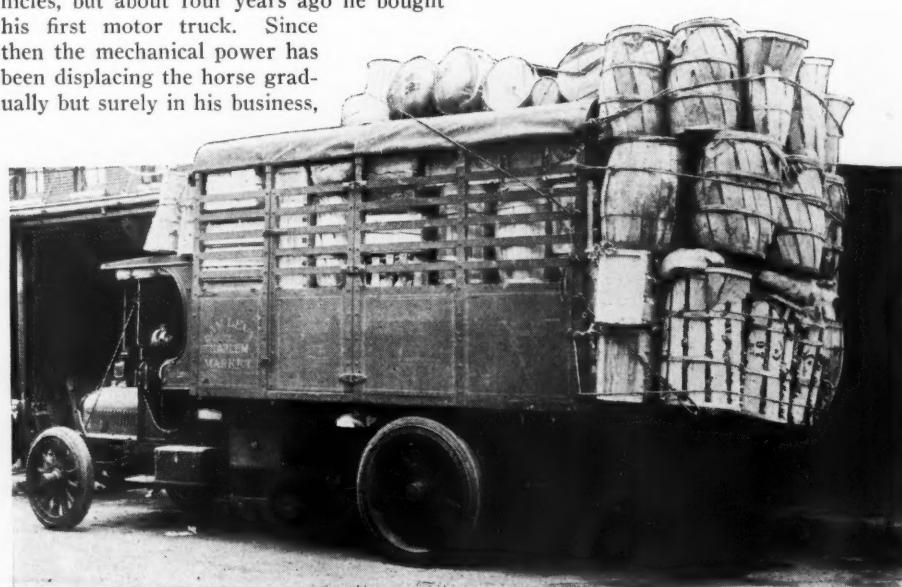


Packard Four-Ton Model, Used in Hauling Produce in New York, by the N. Y. & N. J. Produce Company

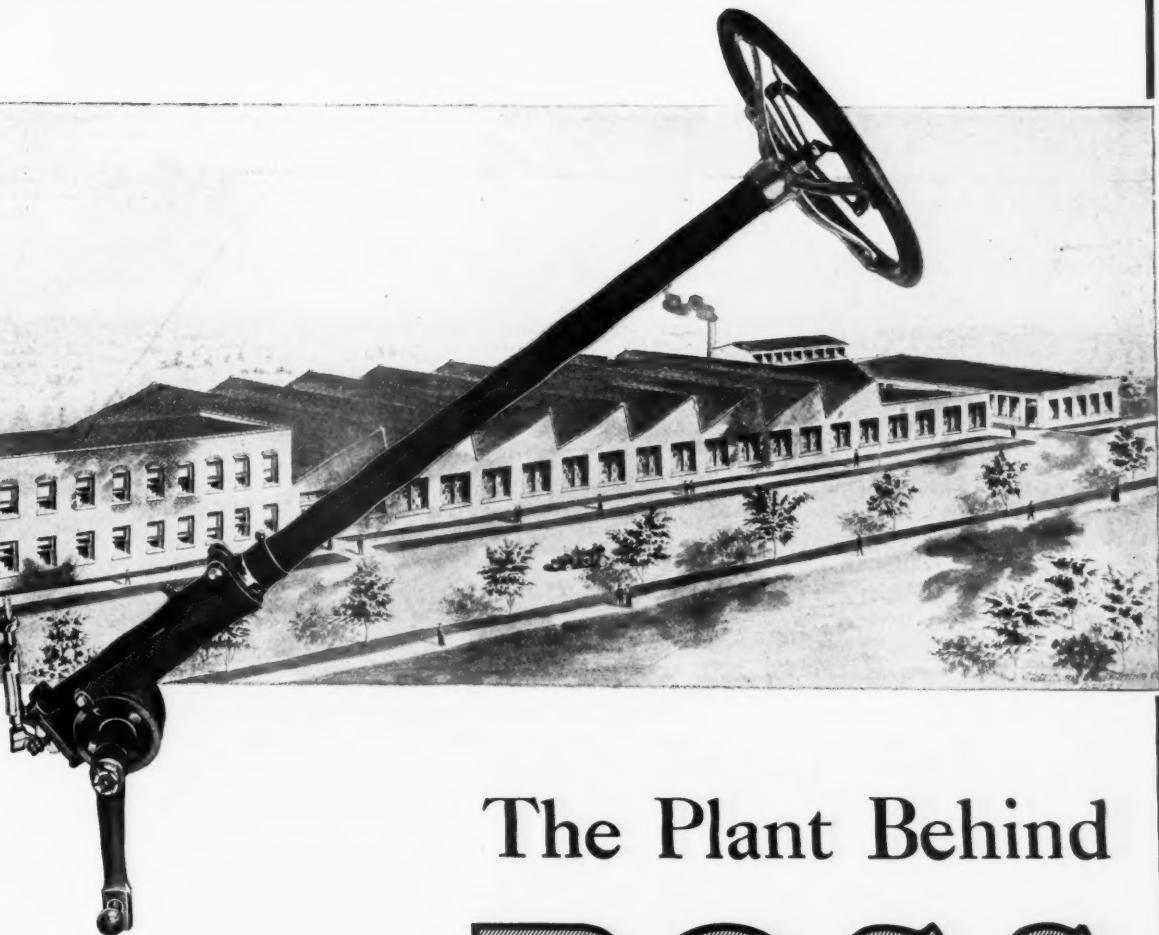
live poultry in crates piled up tier on tier; choice fruits and berries that are worth most when freshest; lettuce and other green things that must not be allowed to wilt and lose their crispness, and vegetables that are finest in flavor when delivered from the farm to the table. In baskets and crates they come, stacked up high upon the three and five ton trucks that look like moving vans, so bulky are the loads corded over cab roof and upon the tailboard. There are many horse-drawn vehicles, it is true, in this food caravan, but the proportion of motor trucks is steadily increasing, and is bound to increase still faster as the utility and economy of the machine is demonstrated.

Of course the farmers and truck gardeners living the farthest from the markets, though within a seventy mile zone, would be the first to realize the advantage of the mechanically propelled vehicle. A trip that would require an all night journey for the team drawing a moderate load, can be made in one-third of the time by a motor truck carrying several times the amount of produce, and truck gardens too distant for horse-delivery are brought in touch with

The West Washington Market. Mr. Feinstein has about a hundred horse-drawn vehicles, but about four years ago he bought his first motor truck. Since then the mechanical power has been displacing the horse gradually but surely in his business,



Produce Hauling With a Five-Ton Saurer



The Plant Behind
**ROSS
GEARS**

"the steering gears which predominate on motor trucks," is the last word in modern construction. Its superlative equipment aids us in affording our customers a service unsurpassed for prompt deliveries.

Ross Gear & Tool Co.
760 N. Heath St. LaFayette, Ind.

Here is the comment of a Long Island farmer, Joseph Navratil, of Jericho. He has owned a five-ton Mack truck for almost two years and is unqualified in his praise of its value for his business. He makes a trip with capacity load to the city every day, often two round trips a day, with an average of fifty miles a day. The truck makes the round trip in four hours. The horses, which he formerly used, required ten hours more, or fourteen hours to make the trip. The fact that the truck may be used every day in the week, twenty-four hours a day if required in the busy season, is an important advantage, as the marketing of produce has its rush seasons, when time is the essence of the profit.

John A. Jantzen, of Hicksville, L. I., is another Mack user who finds that commercial cars put dollars into his pocket. He says that the three-ton truck dispensed with the need of five horses and one man. He makes a twenty-eight mile haul to the markets of Brooklyn and New York in three hours or less, while the teams required nine or ten hours to make the same distance.

Another Hicksville truck user is Edward Scholl, who owns a three-ton Packard,



Packard Used by New York Live Poultry Company
This company displaced all its horse-drawn vehicles with trucks

For the gardener with small acreage the light commercial car should be used to a greater extent around New York. The general utility of the small machine is recognized in the west by ranchers who find it convenient for hauling small loads of produce at high speed, also for bringing supplies, tools, seed, etc., to the farm and for

John Rhodes, of New Hyde Park, L. I., tells of dispensing with two teams by the use of a three-ton Mack, and J. A. Suydam, Jr., of Huntington, L. I., states that for such farm labor as hauling fertilizer the commercial car is far superior to horses. Using his four-ton truck he emptied a box car of fertilizer in one morning, which was better time than he could make previously with two teams of horses. For hauling stable fertilizer the truck or light car can be used to advantage without soiling the vehicle by simply hitching the manure wagon behind the truck as a trailer. Hauling of heavy implements by this method is practical also, in fact there are endless odd jobs about the farm and truck garden that can be handled by the motor truck or light car.

Also the ability of the commercial car to keep on working in all weather conditions is a convincing point for the farmer. He knows that the summer heat cuts down the efficiency of his horses, often fifty per cent., and that the snow makes hauling laborious for the teams, and freezing weather brings the danger of an accident that will cripple a horse. So the immunity of the truck in this respect is an important matter. The Autocar made a practical demonstration of the sort early in March that convinced one man who hauls produce that he needed a machine in his business. J. B. Kirk, a fruit and produce dealer in New York, had a hurry-up order for ten barrels of apples to be delivered to a bakery up town. One of his neighbors had bought one of these light trucks recently and Mr. Kirk was impressed with the way it plowed through the storm



Mack Used by J. A. Suydam, of Huntington, L. I.

This machine is used for hauling produce, fertilizer and for doing general farm work

worm drive. This is used for hauling produce for various Long Island truck gardeners to the city markets. It is thoroughly satisfactory and always "on the job."

The business of collecting products from a number of farms and delivering direct to the city is a field for the commercial car that is capable of considerable development. The farmer who cannot afford to buy a machine of his own is saved the labor of loading his produce on the wagon for a haul to the nearest railroad or trolley station, as the truck will pick up his load at the farm house door and deliver to the market with no re-handling. The less re-handling the better for fruits and vegetables, eggs and poultry in crates, for the danger of damage is thereby lessened, and the profits increased proportionately.

It is probable that the use of trailers will add to the popularity of the commercial car for this business. If a trailer can be left at a farm to be loaded and picked up without delay on the way into the city, the loading can be accomplished without undue haste, and yet there is no waste of time for the truck and the driver.

business trips to town. In the east, the tendency is to replace the horses with heavy trucks, from three to five tons capacity. There seems to be a field here for convincing the small farmer of the value of the light machine.

Of course the heavy truck serves its purpose in general hauling about the farm.



The Modern Farmer Brings His Cattle to the Sale by Truck

United States 'Solid Truck' Tires

Lighter Weight in a Solid Truck Tire Means a Better Rubber Compound

It is a curious fact, proved by actual experience, that the lighter the truck tire, the better the rubber compound used in making it.

Volume for volume, size for size, United States Solid Truck Tires are the lightest in the world.

For example, a set of six 36 x 5 United States Solid Truck Tires weighs 60.6 pounds less than a set of the next lightest truck tires now manufactured.

A reduction of one pound in weight below the springs of a truck is equivalent to a reduction of twenty pounds dead weight resistance to the pull of the engine. Therefore, a set of six 36 x 5 United States Solid Truck Tires relieves the engine of the truck equipped with them of the equivalent of 1,212 pounds dead weight. This means increased engine efficiency, increased life for the truck itself, a saving in gasoline bills, fewer trips to the shop and increased economy of operation.

Prove this yourself. Equip your trucks with United States Solid Truck Tires.

United States Tire Company

1790 BROADWAY, NEW YORK



that was disarranging horse traffic. So he called up the Autocar agency and asked the salesman what could be done about that rush order for apples. The response was convincing indeed. The ten barrels of apples were hauled from Washington St. to the bakery on 59th St. in just fifteen minutes. With his team, Mr. Kirk would have required two hours to make the delivery in such wild weather. Needless to say, the test resulted in the sale of a car.

Such examples will go far to develop a market for the motor vehicle among the farmers and truck gardeners in the vicinity of New York City. Long Island is one vast garden for the feeding of the metropolis, divided in holdings that run from ten to fifty acres, together with some larger farms. The conditions on the Jersey side are similar. Good roads connect this country with the city market by bridges and ferries, and the use of the commercial car is bringing the acres closer to the city, not closer in miles, but far closer in time. And time is the essential that makes for profits in marketing produce.

A GOOD USE FOR THE AUTO TRUCK

By WESLEY HEEBNER



A NUMBER of farmers residing within several miles of Souderton, Pa., take farm produce to the markets in Philadelphia every week. These farmers rent stalls in the big markets for certain days each week, where they sell their produce to whoever comes in to buy. Their custom is to gather produce together, from their own farms and from some of their neighbors.

Formerly they hauled this produce to the railroad station, had it shipped to Philadelphia by train, and from there had it hauled to the market, necessitating handling of it three times. Now to do this they had to haul it from their farms to the station in the first place—usually a distance of from

one to three miles one way or two to six miles round trip. Then they had to pay transportation on it from Souderton to Philadelphia—about thirty-one miles—had to pay their own carfare, and after the produce landed in Philadelphia, pay some one to haul it from the train to the market.

After it had been sold the empty crates had to be shipped home again and they had to pay their own fare back home.

These farmers have done this for a number of years, until this spring some of them got together and bought an auto truck (shown in the accompanying photograph) and hired a man to run it for them. They take turns hauling their produce to Philadelphia on it. The truck makes a trip to and from Philadelphia each day, accompanying two and sometimes three of the men each time, so that from twelve to fifteen farmers can haul their produce to the market on this one truck each week. The truck comes right to their farms, where they load on what they've got, and takes both them and their produce to market within two or three hours' time. When they are sold out, they and their empty crates are hauled again straight back to their farms.

The farmers claim this new method saves them lots of money besides being ever so much more convenient.

I believe, as a general rule, farmers do not realize the possibilities of the auto truck in sending things to market. It brings the distant markets much more closer home. Last year hundreds of dollars' worth of peaches went to waste in this neighborhood because the local market was flooded, while if trucks could have been used to haul them to Philadelphia, many dollars would have been realized. To haul them by train requires three times handling and besides it is too expensive except for very fine fruit.

If the truck manufacturers would send their representatives to farmers' clubs and to grange meetings and get the farmers interested in trucks by showing them new markets for their produce and how they can make more money with trucks; and by

making them attractive offers, such as paying for a truck in monthly installments, there is no doubt but that many more trucks would be sold to farmers. And when the more progressive farmers start using trucks, the more backward ones will surely follow.

NOVEL AUTOMOBILE ADVERTISING USES

By FRANK FARRINGTON



THE ingenuity shown by users of automobile trucks is interesting and the truck user who is satisfied with merely getting a good looking body on his chassis and seeing that it is kept clean and in good repair is falling considerably short of what he might do.

It is no longer a novelty to see delivering done by motor. The truck is no longer per se a sign of the up-to-date in equipment and methods. Since trucks have become commonplace as trucks, it is up to the users to give them added novelty or attractiveness by making them different in design from the usual run of such things.

A prominent tire manufacturer (Diamond tires) is represented on the road by a truck which is made with a body built to represent a cross section of a non-skid tread tire. The effect is in form not unlike the old prairie wagons, as the top is rounded from the bottom of the body, up over and down to the bottom again. On the side is inscribed an advertisement of the company operating the truck. The tread of the tire is of course the top, while the truck bottom takes the place of the rim.

A cigar manufacturer in Dayton, Ohio, not satisfied with a delivery car with his advertisement on it, has mounted on the back of the car a huge cigar bearing the name of the cigar he makes. This cigar is connected in some manner with the exhaust of the motor and whatever smoke is thrown out passes out of the "burning" end of the cigar. Presumably a little extra supply of oil will make the cigar smoke profusely.

A grocer in Marietta, Ohio, who has not found it necessary to evolve a unique body for his delivery truck in order to introduce novelty, has painted on the front of the top, so it is easily readable as the car comes toward you, the following, "Here comes Skipton!" As the car passes and you look after it, having noted on the sides that Skipton is the grocer, you read on the rear of the top, "There goes Skipton!"

This is one of the little touches that show that it is not necessary to spend a lot of money or to go into elaborate devices in order to get the credit that goes with originality.



This Truck Hauls Produce From Souderton to Philadelphia Markets

The CCJ has most readers because it gives most information

Brown Carriage Co., Cincinnati, O., which heretofore manufactured only horse-drawn vehicles, will expand and enter the automobile field with a five-passenger car selling at \$735, and two light delivery cars selling at \$675 and \$670.

Read What Mr. Porter

Production Engineer of the Globe Motor Truck Company says about the Master Carburetor:

Northville, Mich., July 8, 1916.

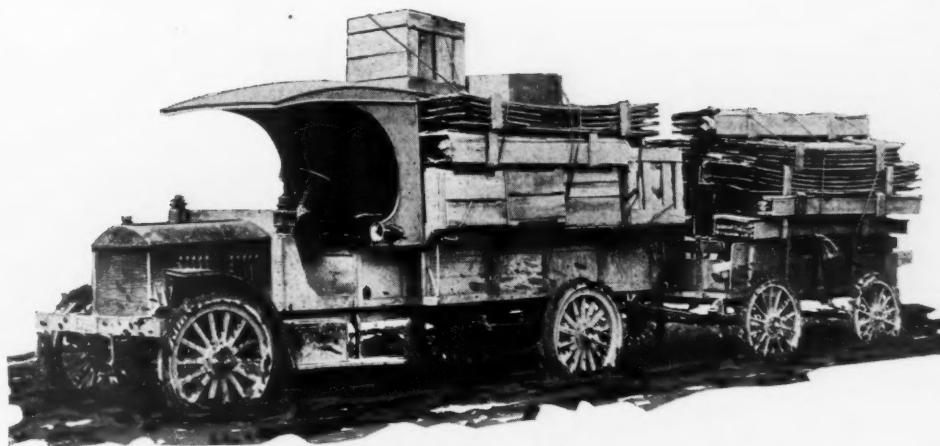
Master Carburetor Corporation,
Detroit, Mich.

Gentlemen:

We wish to say that we have tested out several of the leading carburetors and have never found a carburetor to equal the Master for flexibility, even mixture of gas, easy starting and for use with the poor grade of gasoline we have nowadays. We have also found that it increases power by a large percentage and starts equally well in cold or warm weather. We have been able to make trips through mud and snow with the Master that we absolutely could not make with other carburetors and we know you have a most wonderful carburetor.

Yours very truly,

GLOBE MOTOR TRUCK COMPANY,
G. E. Porter, Production Engineer.



A Remarkable Experiment

This actual photograph shows the finish of a 27 mile haul (Northville, Mich., to Detroit) over hilly and muddy country roads, of a Master Carburetor equipped GLOBE Motor Truck with a Trailer, loaded with 3 tons of furniture lumber.

Already Adopted by 23 Truck Manufacturers

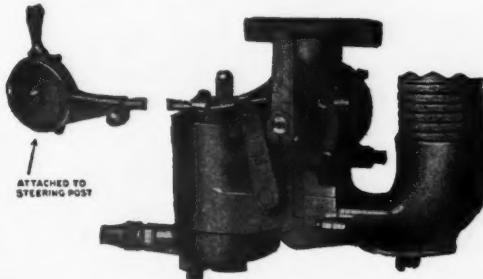
The MASTER Carburetor

after exhaustive tests. This improved carburetor is not like any other you have ever seen. It embodies entirely new scientific principles in its design and construction. Write us for more evidence—absolute, convincing PROOF that the MASTER delivers 25 to 40 per cent more MILEAGE per gallon of fuel.

Steering Post Control!

The air damper of the perfected MASTER is opened or closed from the steering post. A touch of the finger gives a rich mixture for easy starting which can be instantly modified, as the motor picks up speed, by another touch on the steering post lever.

In the MASTER there are no springs, cams or dash pots to get out of order—only three moving parts.



No Adjustments Whatever!

With the steering post control feature of the MASTER the driver never has need or occasion to try to adjust or tamper with the carburetor in any way. Any desired mixture to suit any atmospheric condition is instantly obtained by opening wider or closing the air damper from the steering post.

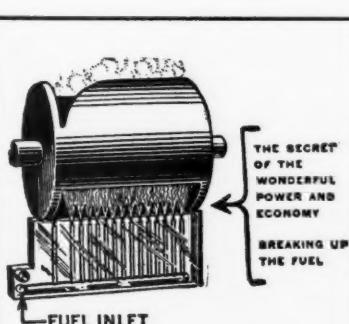
25% to 40% More Mileage

The MASTER cannot be judged by comparison with any other carburetor. To grasp and to appreciate its remarkable superiority, the new principles in its design, its wonderful "flexibility" and how it develops more power and more mileage with the same quantity of fuel can only be understood when you take this carburetor into your hands, examine it and contrast it with ordinary carburetors.

Truck Manufacturers: Write us today for full particulars. We will gladly ship you a MASTER for personal examination upon request. SEE IT, if only that you may be posted and prepared to meet its competition.

**Send This Coupon for Catalog and Valuable New Book Free
"CARBURETION and CARBURETORS"**

Whether you are a manufacturer, owner or driver of motor trucks, send your name at once for free copy of valuable new book. It not only explains the scientific principle and describes the process of carburetion, but also shows why the improved MASTER Carburetor is able to accomplish such marvelous results. Send the coupon now—or a postal—to



Study This Picture

The picture above shows the mixing chamber of the MASTER with its multiple feed. The first hole at the left is never covered and furnishes all the fuel required for idling or slow running. As the cylinder revolves the other inlet holes (14 in number in this one-inch size) are uncovered, ONE by ONE, the gas being thus broken up and vaporized many times more thoroughly than in any other carburetor so that the air is absolutely saturated. The number of inlet holes is increased in the larger sizes, the two-inch model having twenty-one inlets.

Master Carburetor Corporation

Dept. 28

1523 West Fort Street
Detroit, Mich.

You may send me your catalog with free booklet—"Carburetion and Carburetors".

Name.....

Address

Master Carburetor Corporation

Dept. 28

1523 West Fort St., Detroit, Mich.

Pacific Coast Branch:

922-24 S. Los Angeles Street Los Angeles, Cal.

When Writing, Please Say—"Saw Your Ad. in the CCJ"

CONDENSING THE CHASSIS FOR FOREIGN SHIPMENT

With the scarcity of freight steamers and the tremendous demand for space on ocean-going steamers, it behoves the exporter to pack his goods in the smallest possible space, in other words, "condense" the cargo. An example of what is being accomplished along these lines is afforded by the recent truck exports of R. Martens & Co., Inc. By the method employed by this company practically 50 per cent. of space and freight rates have been saved. The idea is to condense the motor trucks into the smallest space that will hold all the parts of the truck without a degree of dismantling of the truck that would cost more than the small additional space saved. So important has it been that the company has leased a factory at Stapleton, Staten Island, as a *dismantling and packing room*. The accompanying illustration shows the interior of the building, a truck in process of dismantling, also a filled box and the chassis of the truck.

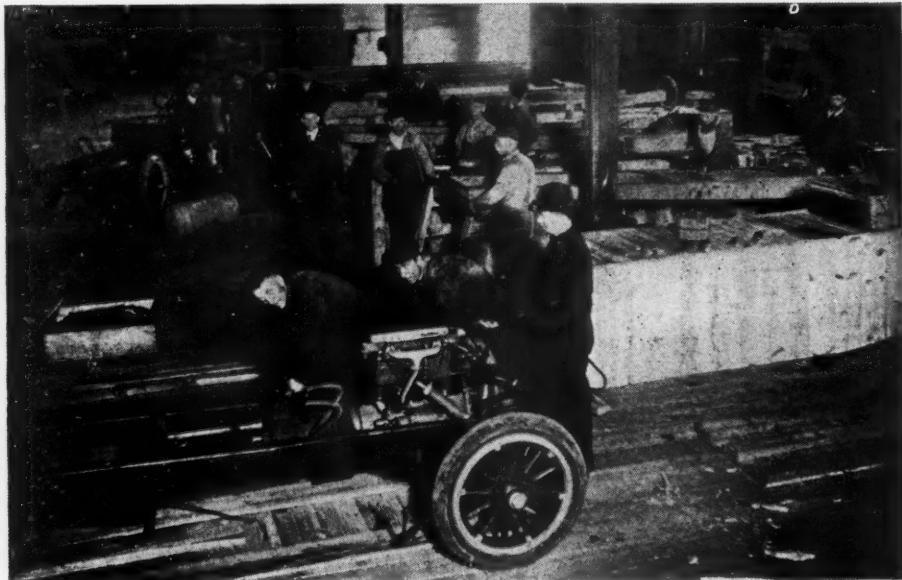
The saving in freight cost is not the only gain made by this method of packing. When cargo space is scarce, a desired shipment may be made impossible by bulk in excess of the obtainable space; or only part of the shipment may be able to find room in the ships. In the second week of June, the Martens Co. shipped 24 motor trucks packed small, in hold-space that would not have held more than twelve trucks packed in the former fashion; a second shipment of 25 trucks, also packed "condensed," went forward a week after the first shipment; and during the last week in June further shipments aggregating fifty trucks were made—a total of 99 motor trucks in the month. In this condensed packing, the dismantling is of a kind that does not involve much time in the reassembling of the motor parts. It is obvious, of course, that if left to an inexperienced packer the dismantling might be carried to a point where the money saved on freight charges would

have to be all paid out for reassembling the truck at its destination.

How the Trucks Have Been Adapted to European Needs

Various details of the motor trucks themselves illustrate ways of adapting machinery for export, and to the usages and conditions of the foreign purchasers. The tail-lamp, for instance, must be on the right hand side for trucks used in England, for the reason that the "law of the road" in England requires vehicles to pass on the left—just the opposite to the usage in Russia and the United States. The control levers are made very large and substantial to endure the rough usage that motor trucks are certain to get. The worst of all faults in an imported car, speaking from the standpoint of the foreign purchaser, are breakdowns due to weakness of parts. The engineers of the Martens Co. have given special attention to providing ample strength throughout the construction of the motor truck.

Other points of specially strong construction are the axles and bearings, and the pressed steel frame; this latter has the exceptional depth of 8 in. at the center. The length and width have been given dimensions so that standard bodies can be readily fitted to the chassis. An interesting mechanical detail is the fact that the gear box is so placed between the clutch and the rear axle that the cardan shaft and the drive shaft are of exactly the same length, and therefore interchangeable—an important feature from the standpoint of service and repair. Cooling of the engine is effected with a radiator of the London General Omnibus type, having straight copper tubes; these have always been found efficient, and have the advantage that if some of the hundreds of tubes be damaged, the injured ones can easily be closed up, while the radiator still remains efficient enough for use.



Interior of Martens Dismantling and Packing Shop

In the left foreground is a chassis being taken down; at the right is a box already packed; further back, to the right, the process is under way

Rims and Tires in Millimeters

Other points of interest are the use of millimeter sizes for rims and tires, making them interchangeable with those of European manufacture. Among many other details incorporated in the Martens car is the scheme of lubricating the springs by screw compression grease cups, connected through drilled holes so that the grease is forced directly to the rubbing surfaces.

Four Capacities in Trucks

The motor trucks now being exported by the Martens Co. are of four different load capacities—four and a half tons, three tons, one ton and one-half net ton, respectively, exclusive of the weight of the trucks. All these trucks have high clearance. All these trucks are built for R. Martens & Co., Inc., at Clyde, Ohio, in accordance with the specifications of the Martens Co. for their export trade.

DEPARTMENT STORE ON WHEELS

By C. L. EDHOLM

At the expense of about fifty dollars, Carl Asherman, of Hope Valley, R. I., converted his Ford into a miniature department store and thereby enlarged the scope of his business as a small-town merchant to a remarkable extent.

The body is a large, square box, with a double door in the back and an interior full of shelves which contain a stock of shoes, men's furnishings, dry goods, "notions," practically all the articles that are in steady demand in a country store. In addition to the regular stock, Mr. Asher-



Asherman's Miniature Department Store

man delivers from his main store anything ordered by 'phone from the twenty or more villages that he serves.

The machine covers a circuit of more than fifty miles every day, winter and summer, and as it takes the goods right to the farm-house door, it is welcomed by the Rhode Islanders as a great time and labor saver. Instead of hitching up his team to run into town for some purchase, the farmer can do his buying at home, and as time is precious in the planting season or during the harvest, this fact is appreciated.

**NEW MOTOR TRUCK FACTORY IN
PACIFIC NORTHWEST. SIX-
CYLINDER TRUCKS NOW
BEING MANUFACTURED
IN TACOMA**

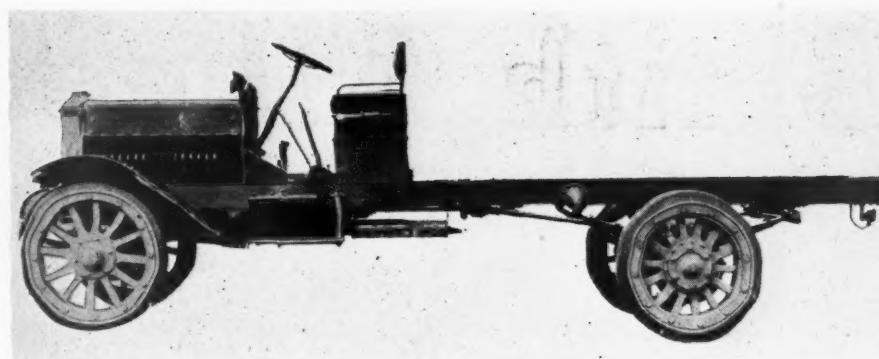
Taking advantage of the increased demand for motor trucks in the Pacific Northwest, the Gerlinger Motor Car Co. has established a motor truck factory in Tacoma, Wash., and is specializing on a two and one-half-ton worm gear truck which has been named the Gersix.

The various features incorporated in the design of the Gersix truck were chosen because they were especially adapted for the Pacific Northwest territory, to which the company for the present is confining its entire attention.

E. E. Gerlinger, well-known distributor of motor trucks in the Pacific Northwest, is president and manager of the company. The Gersix truck is a six-cylinder model designed by George H. Peters. For the present a two and one-half-ton capacity is the only size being built, but the company expects to announce other sizes very shortly.

One of the main features in the design of the Gersix is the simplicity and accessibility of all working parts. The construction throughout is very sturdy and very compact. A six-cylinder Wisconsin engine cast in block is being used, $3\frac{3}{4}$ in. bore by $5\frac{1}{2}$ in. stroke.

Another feature is the adoption of electric starters and electric lighting equipment, the advantages of which will be recognized by every truck owner. Worm gear drive is used exclusively. A two-unit Westinghouse electrical system is used to supply current for the ignition, starting and lighting equipment. Westinghouse equipment is standard on all Gersix trucks. The drive shaft has three



Gersix Two and a Half Ton Worm-Drive Truck Chassis

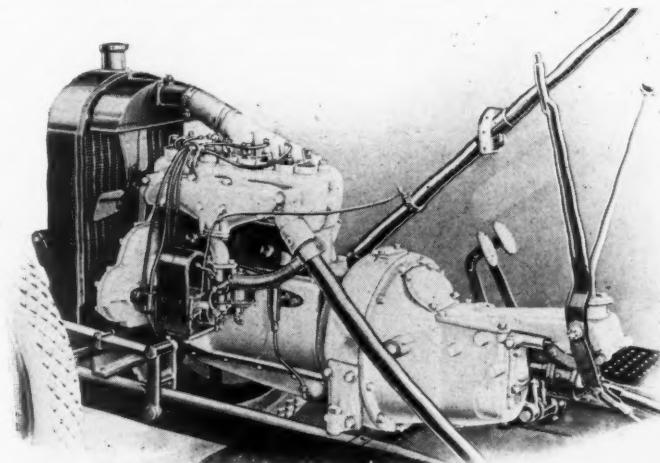
Has six-cylinder engine, $3\frac{3}{4}$ in. bore, $5\frac{1}{2}$ in. stroke; Westinghouse ignition; three-speed individual-clutch transmission, and 150 or 170 in. wheelbase. Chassis price is \$2500 for the short wheelbase, \$2550 for the long wheelbase.

universal joints with a self-aligning bearing at the middle.

The steering wheel is placed to the left and the control levers in the center. Gas control is by foot throttle only. The spark control is automatic, leaving the steering wheel free from any controls whatever.

Specifications of the Gersix

Some of the specifications are as follows: Weight, 5000 lbs.; Stromberg carburetor, Fedders honeycomb radiator, disc clutch, three-speed transmission with individual clutches, Acme universal joints, semi-elliptic springs, 36×4 in.



Power Plant of the Sheridan Light Delivery

The engine, clutch and transmission are of unit construction. Ignition is by Bosch high-tension magneto

tires front, 36×7 in. rear; 150 or 170 in. wheelbase, loading space, 124 or 144 in.

Price is \$2500 for the short wheelbase and \$2550 for the long wheelbase.

**NEW MODEL SHERIDAN
COMMERCIAL CAR**

The Sheridan commercial car of light delivery type is now being made in a slightly larger size, the new model having a carrying capacity of 1000 lbs. and lists fully equipped at \$540. The engine is rated at 22 h.p. and has a bore of $3\frac{1}{8}$ in. and stroke of 4 in. Cooling is by thermo-syphon system. Ignition is by Bosch high tension magneto. Clutch has six plates. The wheelbase is 104 in. and the tread 36 in. Wheels are 30×3 in., fitted with $31 \times 3\frac{1}{2}$ in. Goodyear oversized tires. The dimensions of the carrying space are 44 in. wide by 56 in. long. The side boards are 9 in. high. Otherwise this car follows general lines and specifications of the smaller model described in the February, 1916, issue of this journal.



Sheridan Light Delivery Car, \$540 Fully Equipped

Price of chassis only is \$490. The carrying capacity is 1000 lbs. The engine is a 4 cylinder, rated at 22 h.p.; $3\frac{1}{8}$ bore, 4" stroke

Smith Wheels Make T



"EVERLASTING"

Tire
and Gasoline
Mileage
Much
Greater

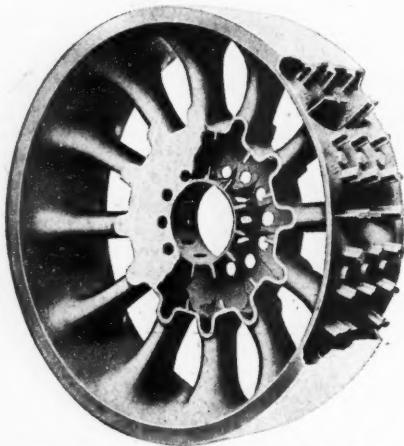


"EVERLASTING"

Horse and Wood Age Past

Here is the last word on the Wheel by leading Motor Truck Engineers of America—Europe is on metal wheels already: "The Motor Truck, like the steam and the modern big electric locomotive, requires indestructible metal wheels."

The Smith Wheel is the "Everlasting," dependable wheel of metal, unsurpassed in design—in strength equal to the load any road will sustain—lighter than wood, but very many times stronger.



Sectional View of Smith Wheel showing Hollow Construction of Hub, Spokes and Felloe with Internal Braces.

Smith Wheels are guaranteed during the LIFE OF THE TRUCK on which they are originally placed

Smith Wheels made for Trucks of all capacities and to fit any axle. Production facilities equal to your needs.

SMITH WHEEL
SYRACUSE, N.Y., U.S.A.

Some Smith

L. C. Smith Gun
Smith Premier Typewriter

We will be glad at ANY
ANY wheel in com

NO MAINTENANCE COST

When Writing, Please Say—"Saw Your Ad. in the CCJ"

Trucks More Saleable



"EVERLASTING"

**Trucks with
Smith
Wheels
Last
Longer**



"EVERLASTING"

Gasoline and Metal Age Here

Many notable manufacturers, appreciating its unusual value, are adopting the Smith Wheel for their trucks.

They realize that here, at last, is a Metal Wheel, which, in addition to extreme merit, has an appeal to the Buyer and User of Motor Trucks so real and definite that it cannot be overlooked. In looks, as well as in quality, the Smith Wheel stands in bold relief.

How Smith Wheels Save The Truck

Bearings, Differential, Transmission, Clutch and Motor wear longer on the Truck equipped with Smith Wheels, as neither drouth, wet weather, shrinkage, expansion or road impact at speed under heavy load can change them from their original shape.

A Wooden Wheel is always eccentric. This tends to tear the heart out of the Truck through constantly unequal, jolting strain upon the driving mechanism. Collapse of a wheel, too, often means damage to the entire vehicle.

Smith Wheels stand up forever, and never get "out of round." They are GUARANTEED for the Life of the Truck.

Successes

Ithaca Gun
L. C. Smith & Bros. Typewriter

Time to make ANY test of
comparison with ours.

Smith Wheels equally good in temperature far below zero or heat that neither man nor rubber can stand.

Smith Wheels are guaranteed during the LIFE OF THE TRUCK on which they are originally placed

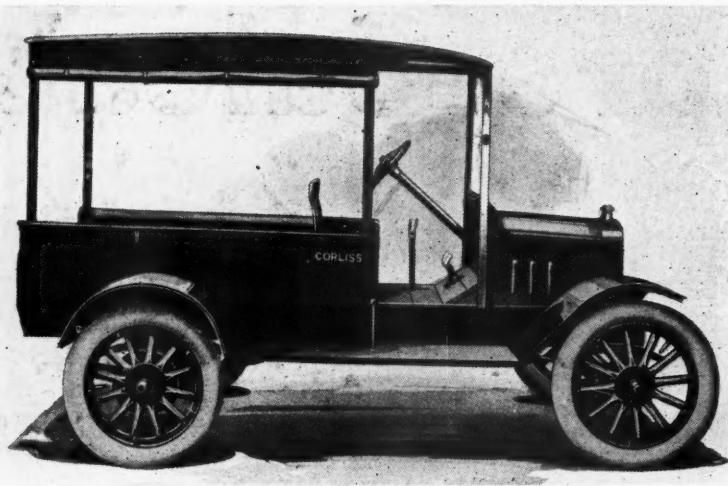


Completed Smith Wheel, ready for shipment.
Built for Pressed-On Tires. Will take Demountable Tires.



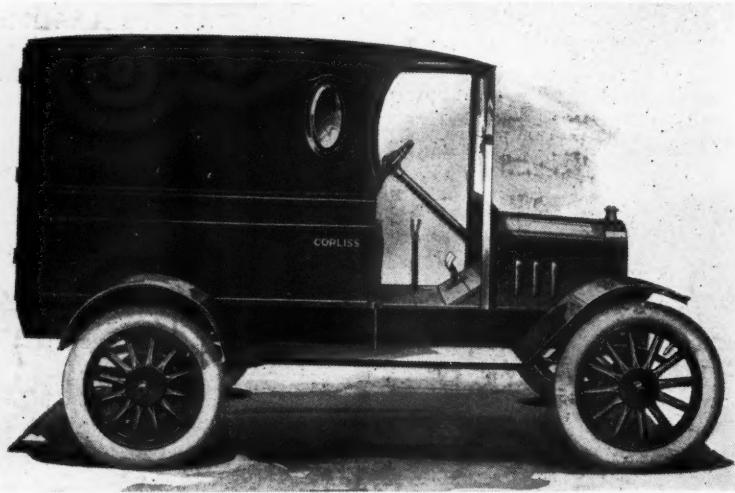
CUTS OPERATING COST

When Writing, Please Say—"Saw Your Ad. in the CCJ"



Corliss Light Delivery Express, \$650

The engine has a bore of $3\frac{1}{8}$ in. and stroke of $4\frac{1}{2}$ in., unit power plant, three-speed selective sliding transmission, high-tension magneto, I-beam front axle and three-quarter floating rear axle; capacity one thousand pounds. Made by Corliss Motor Truck Company, Corliss, Wis.

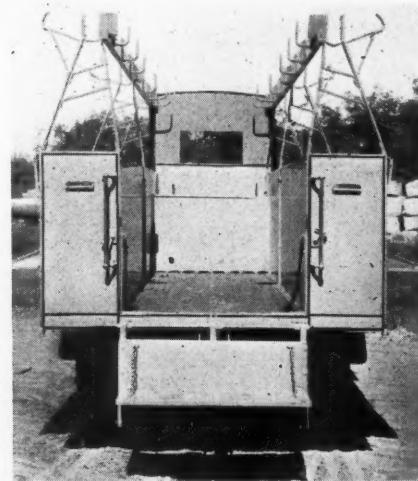


Corliss Light Delivery Parcel Body, \$695

Tires are 31×4 in. on Q. D. rims; complete equipment; 100 in. wheelbase; full-elliptic springs all around; capacity one thousand pounds. Made by Corliss Motor Truck Company, Corliss, Wis.

PUBLIC SERVICE CORPORATIONS INVEST HEAVILY IN COMMERCIAL CAR EQUIPMENT

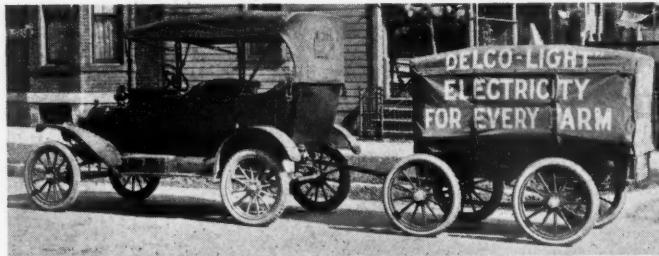
Few fields of motor truck application furnish as many interesting examples of the machine's versatility, efficiency and economy, as in the service of the public utility corporations. Examples of economy have prompted owners and engineers to carefully study the possibilities of the trucks and to apply their uses in many new and interesting ways. The result of these investigations is reflected in the many orders placed with the White company for specially designed pieces of motor apparatus to meet the individual requirements of each concern.



White Truck With Special Telephone Body

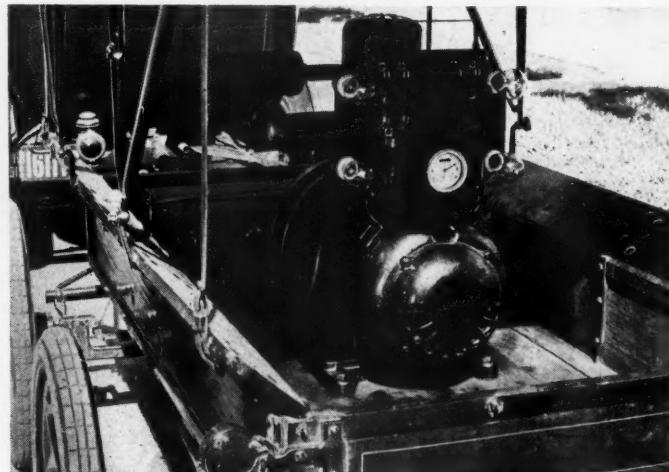
Rear view of special telephone truck, showing tailgate in opened position

Gasoline trucks satisfactorily answer all the hauling problems of public utility service or in auxiliary service, which is incidental, and there is not a single quality of the truck that cannot be readily converted into substantial profit to its owner. The speed of the lighter vehicles saves time in



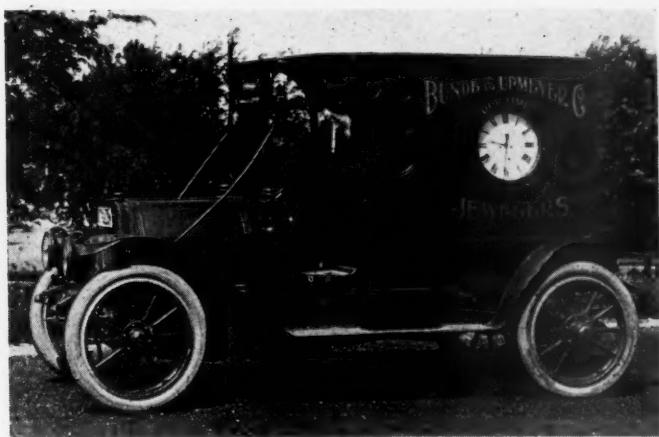
Miami Trailer Helps Put Through Big Sales Campaign

When the Domestic Engineering Company, of Dayton, Ohio, decided on a great selling campaign of its new product the Delco Light Plant for furnishing electric light and power to farms and suburban homes, the problem to be met was the transportation from town to town of its demonstrating outfits. The problem was solved by the use of an automobile and a specially designed trailer made by the Miami Trailer Company, of Troy, Ohio. One of these outfits is illustrated herewith, as well as the lighting outfit as it is mounted in the trailer. The use of a trailer permits the salesman who may be visiting a number of prospects in a locality twenty miles or more from his agency town, to leave the trailer in some convenient place over night, returning next day to visit the remaining prospects in that locality.



Showing One of the Demonstrators Mounted on a Trailer

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers



A Jeweler's Delivery Car

When business houses do take advantage of the advertising possibilities of their cars, which is comparatively seldom, it is usually by means of much big lettering and bizarre colors. A Milwaukee jewelry firm, however, has devised a scheme which is at the same time unique, dignified and an excellent advertisement of its business. This has been done by placing a large clock in each side of the body as shown in the accompanying photograph. The well-known Seth Thomas works are used in these clocks, which have faces 12 in. in diameter. Heavy plate glass protects the faces while the protection to the works is afforded by wooden boxes extending inside the body. The clock mechanism is hung on all sides by coil springs to absorb the road shocks. That this mounting is a success is proven by the excellent time that the clocks have been giving during several years of service.

making deliveries, and a truck of this type can also be used as an emergency wagon to quickly transport men, tools and materials, to restore interrupted service. A truck can operate in an almost unlimited territory and by means of its greater carrying capacity larger crews and greater quantities of material and equipment can be carried in a single day. Its dependability is a positive fact and the power of its motor is always available for performing countless duties formerly done by workmen.

The types of gasoline motor equipment used by public service corporations include construction and delivery trucks, line repair trucks, emergency trucks, cable pulling power winch trucks, tower trucks, wrecking trucks, ash removal trucks equipped with electric railways use bus lines for providing new transit facilities in the extension of existing street car systems, and in the relief of neglected territories, to which it is impossible or impractical for traction companies to expand.

Electric railway and power companies have an enormous amount of supplies to be transported. These supplies consist of materials for work on the street or road and the usual operating equipment required. In the case of the railway this equipment consists of supplies for the car houses,



Packards for "Uncle Sam"

A line-up of motor transport for "Uncle Sam's" men on the Mexican border. View at the plant of the Packard Motor Car Company, Detroit, where large numbers of motor trucks are lined up in the yard, awaiting the cars to take them to the scene of our present military activity. The Packard truck plants are working twenty-four hours daily, meeting the Government's call for motor transportation units. The company is calling the attention of all material producers from whom it purchases to the act of Congress of June 23, 1916, which requires that "in case of actual or imminent war, government orders for munitions or supplies must be given precedence over all other work", and urging co-operation in giving our mutual "Uncle Sam" the best of service.

shops and trainmen's headquarters, and in case of the power companies for sub-stations and construction gangs. All electric roads have supply cars, but they must also have motor trucks for distributing and collecting supplies and materials located at a

distance from the tracks. Interurban lines have considerable construction work to be built across country in rural districts and in this case the motor truck is valuable in distributing material and carrying supplies and workmen from one section to another.



Special Body Assists Hauling of Long Pipes

The long body on this truck makes it easy to load and haul lengthy sections of gas and water pipe without excessive overhanging.



Chicago Pleasure Car Dealers Use Commercial Cars to Deliver Machines

Above are reproduced two Diamond T commercial cars, one used by Louis Geyler & Company, 2500 Michigan Avenue, Hudson dealers, and the other by Harry Newman, 25th and Michigan Boulevard, for delivering Chalmers cars. As will be noted the bodies are specially designed at the rear to facilitate loading.



Unseen Unheard

-yet working for
you every moment
you drive your
car-

HYATT
• **QUIET** •
ROLLER BEARINGS

